ILLINOIS MEDICAL JOURNAL

THE OFFICIAL ORGAN OF

THE ILLINOIS STATE MEDICAL SOCIETY

VOL. XXVII CHICAGO, ILL., FEBRUARY, 1915 NO. 2

Original Articles

THE SOCIAL ECONOMIC ASPECT OF TUBERCULOSIS.*

M. SAHUD, M. D.,

CHICAGO, ILL.

In order to understand properly the social-economic aspect of tuberculosis and the attitude the medical profession has to take in this question, it is necessary to understand the trend of progress of medicine in general.

August Comte in his positive philosophy outlined the progress of society in his famous law of the three stages. According to this law every branch of human activity passes through the theological, metaphysical and positive stages. If in our imagination we look backwards hundreds of years and watch the evolution of medical science we will observe the above mentioned stages through which medicine passed. In the theological stage the cause of disease is a supernatural evil agent, which has to be driven out by prayer and incantation. Priests in ancient times, medicine men among the savage tribes now, sorcerers at all the dark times, are the representatives of the medical art and science of this period.

With the development of mankind the metaphysical philosophies appear, and they find their place in medicine also; spirits and humors circulating in the blood are used to explain the physiological and pathological phenomena of the human organism. The chemical school of medicine follows closely, and only with the modern development of biology, with Virchow, Pasteur, and Lister in the lead, medicine is entering into the positive or truly scientific stage of its development.

In its evolution, medicine, like all other sciences, is at the beginning comparatively simple, dealing with simple uncomplicated phenomena; all diseases are due to an evil spirit, and prayer or incantations are the only means to cure them. Experience later on shows that the conception of disease and its cure is more complicated; anatomy, chemistry, materia medica, and physiology begin to be parts of a complicated system of medicine, in which the diseases begin to be classified according to their causation and symptomatology. Medicine, in other words, is entering into the scientific stage. But still the physician deals with the individual organism only. Sociological, economical, or political factors influencing the health and life of human beings are not taken at this period into consideration, and the "learned" profession stands aloof from political and social activity. Now when biology has reached such a high degree of development, when politico-economical sciences are forcing their way ahead with the enormous amount of accumulated material, the physicians begin to see causes of disease, not only as they have been seen before—in evil spirits, humors, chemical changes or bacterial agencies—all of them within the individual, but they begin to see causes outside of the individual, in society, in the present social and economic conditions. These causes being social in their origin necessitate a "social" remedy. Or in other words the members of the medical profession become not only healers of diseases of individuals, but active factors in shaping the social conditions of life. As a result preventive and sanitary medicine has been the first to force its way to the front. But that was not enough. The medical profession begins louder and louder to demand a hearing of the public in questions of diseases where the cause is social and threatens to affect the welfare of society, and it comes forward not only with new methods of treatment, new drugs or new serums, but with distinct propositions to legislatures and governments of certain social and economic changes. The last congress of neurologists and alienists in Chicago is a striking ex-

*Read before the Northwest Side Branch of the Chicago Medical Society, Oct: 2, 1914.

ample of the social activities of the medical profession. The result of their work is embodied in a set of resolutions to governors and legislatures of our states recommending legislative, social and economic measures, necessary for the prevention of certain diseases.

This trend of medicine is not yet completely grasped by the entire profession. The wise and the leaders see it clearly, some of the great mass of practitioners follow their leaders instinctively, and the majority still look upon themselves as curers of diseases of individuals only. The quicker they will fall in line and understand their social mission, the quicker society will rid itself of all those dreadful social diseases which take annually more lives than any war ever did. With this point of view in mind, I am coming to the theme of my paper tonight.

Dr. Theodore Sachs of Chicago, with his untiring energy and organizing ability, has perhaps done for Chicago more than anybody else on the question of tuberculosis. His extensive work caused him to pronounce tuberculosis the poor man's disease. Professor Osler emphatically states: "Tuberculosis is a disease of poverty." The tuberculosis exhibits which are doing so much for the education of the people illustrate the cause of tuberculosis in statistical tables and in pictures of the dwellings of the poor—of their bedrooms lacking air and sunshine, pictures of the slums, poverty and vice; and whatever the cause of tuberculosis may be, whether the tubercle bacilli, or the diminished resistance of the body, due to overwork, or lack of air in the dwellings or workshops, or to lack of proper nutrition, the underlying primary cause in the final analysis is poverty of the masses.

The economic basis of society is the working class, which produces all the necessities and comforts of life and all the wealth of society.

It is this working class that lives in the unventilated, crowded, insanitary districts and tenements of our cities. It is the workingman and his family that are underfed. It is the working class that supplies the population for the slums and vice districts, and all this is done not from choice, but from necessity; poverty is the only cause of it. Where there is no poverty, where there is plenty of sunshine in the house, where the rooms are not over-crowded, where the people have plenty and healthful food to eat, where the children do not have to work or overwork to assist in the support of the family—there is no tuberculosis. Of course, we have rich patients with tuberculosis. But I need not stop here to explain the cause of such cases. Tuberculosis, as a rule, remains the disease of poverty.

The extermination of tuberculosis therefore is not in a medicine, serum, vaccine, or antitoxin of any kind, but in the removal of the primary cause.

While modern methods of treatment may be able to produce cures in some very few cases, and arrest the development of the disease in others, they are powerless to stop the appearance of *new* tubercular cases, as long as poverty with all its vices continues to flourish.

Let us see a few figures which will show more than words what a social structure made up of two extremes; trusts and capitalists, with an ideal of life, to accumulate as much as possible by any means, on one side, and of poverty stricken all the time or some of the time workingmen with an ideal of making a living only all the time, on the other extreme, what such a society has done on the field of tuberculosis; first to produce it, and then to prevent or alleviate the sufferings from it.

In the United States alone there are more than 150,000 deaths from tuberculosis at the average age of 35 years. At this age, according to the tables of expectancy of life, the deceased ought to have lived 32 years more. So that the real loss of life, measured in time, will be 32 years of useful work for every individual dying from consumption, or the entire loss of time will be represented by 4,800,000 years annually. If we assume a very low value for a year of human life after the age of 35 years is $50, the real loss to the nation resulting from tuberculosis may be estimated at $240,000,000 per annum.*

This figure is a bargain on human life; the sufferings, miseries, tears, the love of mothers, brothers, sisters of the victims of this dreadful disease are not taken into consideration.

Professor Osler calculates that there are at least 1¼ million cases of tuberculosis in the United States all the time, and this is certainly a very conservative figure. These are all more or less in the position of invalids, i. e., not able to work. But let us assume that only one-fourth of them cannot work. They must then be supported in some other way than by their own labor; either by private or public help. The wages then of this one-fourth, or of

*Huber's "Civilization and Consumption."

312,500 men and women, at the rate of $1.50 per day, would amount to 150 million dollars a year. This represents the sum lost annually by the nation because these men and women are unable to work. If there were such a loss of money from any other cause which was preventable, there would be a continual agitation in the press and public meetings until it would be corrected. Take, for instance, the loss of $50,000,000 annually paid to foreign ship owners, or in other words a loss of this amount to the American shipowners. A cry was raised of the enormous loss the American nation sustains yearly in the shipping industry, and it caused a subsidy bill to be considered by the congress, calling for an annual expenditure by the federal government of $9,000,000. Yet we have in tuberculosis an annual loss of three times as much in money, and in pain and suffering beyond description, but we do not hear of millions being given by the federal government for fighting this dreadful enemy of society.

Now, so far as our own state of Illinois is concerned: In 1903, 7,000 persons died of tuberculosis; half of them between the ages of 20 and 50 years. The estimated loss to Illinois from this disease alone was $36,000,000. The medical authorities of our state, as in other states, have found that more deaths are due to tuberculosis than to typhoid fever, scarlet fever, diphtheria, measles, all forms of bronchitis, influenza and smallpox taken together. And with all that what have our federal, state, or municipal governments done for the war on tuberculosis? To overcome typhoid fever only, Chicago spent $40,000,000 for the drainage canal to purify our water supply; and, as I understand, more millions will have to be spent. But for tuberculosis you don't hear of millions appropriated. Is it not clear to any common sense person, that the millions are more necessary for tuberculosis than for any other disease? Where, then, is the reason for our legislatures lagging behind in taking adequate measures for such an important national calamity? The reason is in the class structure of our society, based on private ownership of capital and of all the means of production and distribution; in living and working for profit and not for social welfare, and in general to the lack of social and religious ideals.

Take the illustrations I mentioned; the shipping subsidy and the drainage canal. The shipowners or the shipping trust are not workingmen depending on a daily job, and suffer only from lack of larger profits, not from lack of daily bread, and they are getting millions to subsidize them. Tuberculosis on the other hand is a disease of poverty, due to uncertain employment of the workingmen. Now as to the water, it must be drunk by rich and poor alike, while tuberculosis selects the poor. If the poor working people die out from the white plague, others take their places. The profits of the capitalists do not suffer from a tubercular death rate. It is true the capitalists support all the charity institutions, which minister greatly to direct and indirect victims of consumption. But those donations figure on their books as other expenses of running the business, and are merely added to the cost of the product, for which the workingman pays. All of us know that many a time when Mr. Rockefeller donated a million to the University of Chicago, kerosene went up in price a fraction of a cent. And when the beef trust had to pay a $2,000,000 fine, beef has risen two cents a pound the next day. Is it not clear that in the long run the charitable millions are supplied by the working class? The rich man in the process of social evolution has merely made himself the agent distributing part of the workingmen's money, and appropriating the glory for giving it.

Then we have to consider not only the tuberculosis death rate, but also the condition of the dependent members of the family, who suffer from it. We cannot also overlook the social problems caused, and their relation to this disease; as child labor, sweat-shops, prisons, etc. Time will not allow entering into all these questions. Suffice it to say it will only make the problem still graver, and bring us into realms of a purely social and economic character. But from what I said it is clear that a society of rich thriving on the poor cannot *exterminate* tuberculosis.

Now let me cite you some other instances showing how business interests stand in the way not only of exterminating tuberculosis, but even of improving the conditions of tubercular sufferers, and of diminishing the spread of this disease. I will mention only the Goodsell-Bedell bill of New York state, which for years made it impossible to establish a sanitarium for consumptives in the state of New York. Here is a quotation from the New York Times: "It was one of the

most disastrous measures which have received legislative and executive sanction. The effect of this law is to make it impossible for any city in the state, or any fraternal order, charitable society, or philanthropic individual, to establish a hospital or similar institution for consumptives outside the city limits, except under practically prohibitive conditions."

The New York Academy of Medicine vigorously protested against this bill, and petitioned the governor not to sign it. Here is the resolution of the New York Academy of Medicine: "Resolved, that the New York Academy of Medicine deplores the passage of the above bill, and urgently requests His Excellency, the Governor, to withhold his signature to the act, which, in case it becomes a law, would involve the loss of thousands of lives and increase the spread of tuberculosis within the crowded districts of our cities and towns, and would have to be considered an act of the greatest injustice and inhumanity." But all in vain. Behind the bill stood three New York multimillionaires, who, as is the case everywhere, had the legislature in the palm of their hands, and the Governor was their creature, and no appeal of the consumptive sufferers or of men of science could go against the phthysiophobia of the powerful interests, whose only arguments was their own will combined with property rights.

When we come to preventive measures inaugurated by municipalities in the shape of sanitary reforms, or regulations for the tenement house buildings and sanitation ordinances, we see again that private profit is in the way. This is splendidly illustrated by the work of the Trinity Church corporation of New York city, which owns several blocks of tenements. "For 15 years it opposed sanitary reforms in tenements. Their tenements in the lower West Side of the city were the worst places for tuberculosis—the lung blocks, and contained also the worst saloons and sporting houses. In the course of time public opinion was aroused against this corporation—not because there were no worse tenements, but because of its church connections,—and an appeal was made to the law. All the force of its great wealth, its religious authority and its tremendous social prestige were used to fight the sanitary reforms in the tenements. Although in the end they had to bring their tenements to a better condition, the church nevertheless succeeded in obtaining court decisions which have crippled every new attempt at tenement reform." (Huber.)

Mr. S. H. Adams in his article, "Tuberculosis, the Real Race Suicide," finds the tenements of the University of Chicago in the slum regions on the south side not without sin against sanitation. He says:

> To the passer-by they are distinguishable by being a little more out of repair than their neighbors. A few are so bad that even the hardened tenement dwellers shun them, and in these teeming thoroughfares they stand silent and unpeopled. The average Chicago university tenement may not be the worst in the city, but it is sufficiently bad to furnish plenty of tuberculosis subjects for the Rockefeller fund experiments. Nor is there bright prospects of improvement, for the University of Chicago operates its own tenements, and it is not what would be called a good agent. Its replies to repeated appeals for repairs and better sanitation constitute an interesting study in the science of evasion and noncommitment. Very possibly Mr. Rockefeller knows nothing of the tenement branch of the Chicago University. But members of the faculty, with whom I have talked, know of it and are not proud of it.

Gilbert Slater in his book, "The Making of Modern England," describes the pernicious influence of the financial interests on sanitary legislation in England. On page 168 he says:

> The act (constituting the General Board of Health) was only temporary. Unless renewed, the board was to cease to exist at the expiration of five years. This was a fatal weakness, because it encouraged all vested interests, threatened by the advance of sanitation (and it is remarkable how many of these interests there were) to obstruct and resist the board, and it also deprived the officials of any reasonable hope of advance and security for the permanency of their appointments.

Lord Shaftesbury and Sir Edwin Chadwick, the first English Commissioners of Health, have the same complaints against the powerful financial interests, whose influence was felt from the lowest official to the prime minister of England.

In his diary for Nov. 17, 1852, Lord Shaftesbury writes: "I am grieved to learn that not only nothing was done by the government (on the question of sanitation), but that the ministers will take good care that nothing shall be done by any one else. The Board of Health is to be destroyed; its sin is its unpardonable activity."

The medical profession must be given credit for all that has been done on the question of treatment and prevention of tuberculosis and

for all that it is doing for the education of the people on that subject. There is no doubt that the death rate from tuberculosis has been diminished for the last decade, and may or may not (as last year has shown), continue to diminish, but the purely medical and sanitary efforts will never go to the root of the evil, to the primary cause, poverty of the masses, which increases parallel with the growth of concentrated capital.

And here is the point where the physician to do his duty enters the realm of politics, which is nothing else than the practical application of sociological and politico-economical sciences. We are weak in this branch of social activity. Lack of organization is ascribed by many as the cause; but this is a false interpretation. The real cause is that the rank and file of the profession did not grasp yet completely the field of social-economics into which evolution of society and of medical science is leading them.

It is therefore the duty of the physician to study social-economical problems and through political action become an active force in social life by applying his medical and sociological knowledge to the solution of questions in which both these branches are interwoven, as the questions of exterminating tuberculosis or typhoid fever or other diseases of a social origin. The Pirogoff Medical Society of Russia gives the most striking example of physicians acting on the social-economic field. In 1905 the question of treatment of typhoid fever among the peasants came up for discussion. The result was a unanimous decision to petition the government of the Czar to give more land to the peasants. One who knows the terrible poverty of the Russian peasants, of which only one-third are able to eat pure unadulterated bread during the entire year, will appreciate the decision of the Pirogoff Medical Society.

Such active, intelligent work on the political and social fields are important for the physicians, not only to enable them to better fight the diseases of social origin, but for their own self-preservation.

With the increase of poverty the average income of a physician, taking in consideration the present standard of life, is diminishing. The bulk of practitioners depend on the masses. If they are poor the physician cannot get out the value of his work, and the profession is getting thus gradually pauperized. Take the German Kranken-Kassen, or the English industrial insurance, where the physician's fee is reduced to a mere pittance. A skilled artisan gets more than a physician under the above mentioned conditions. Similar legislation is under consideration in Springfield, and in the next legislature we can expect enactment of bills of a nature similar to the English industrial insurance or German Kranken-Kassen. Such legislature will be hard or impossible to fight, because it is based on a quasi-humane, philanthropic principle; help to the poor workingmen. The poor masses, which make up the majority of voters, will morally support such legislation, not understanding that by such action they establish firmer the principle of poverty. Cheap soup-kitchens, cheap municipal lodgings, cheap professional services are not a cure for poverty. They make it only more chronic. The real cure is to put the workingmen on a basis of economical prosperity and independence. Then and then only will the workingmen be able to live in spacious, airy, well ventilated rooms; then they will have plenty of healthful food for themselves and their families; then their children will not have to work and overwork in factories, mills, and mines; then the workingmen will be able to pay decent fees for professional services, and then poverty will be no more the cause of tuberculosis.

RECENT ADVANCES IN THE DIAGNOSIS AND TREATMENT OF PULMONARY TUBERCULOSIS.*

EUGENE J. O'NEILL, M. D.
CHICAGO.

As the title of my paper indicates, it is my intention to deal with various selected topics in the recognition and care of pulmonary tuberculosis without attempting any full and proportioned essay on the subject.

It is trite to say that tuberculosis is still the greatest single foe of man. The most authoritative statistics at hand still place its yearly toll of men and women, for the most part in the prime of life, at about 200,000 for the nation and over 3,500 for this city. If this huge plague which leech-like lurks in our midst is to be successfully combated, those especially interested are as one in declaring that pulmonary tuber-

*Read at meeting of Englewood Branch, Oct. 6, 1914.

culosis must be recognized earlier than it is as a rule at present. There appears to be too much timidity on the part of physicians in making an early diagnosis. If we are to wait till there exists a profound anemia and pronounced loss of weight and until the sputum teems with bacilli, we are in most cases allowing damage to proceed to a point where very little can be done toward returning to society a happy and useful member. Not only this, but we allow many of those in the immediate environment of the patient, especially children, to develop foci which either then or subsequently may lead to active disease. Authorities tell us that too many cases of early tuberculosis are masked under the diagnosis of a "run down condition," "catarrh," "chronic bronchitis," "lagrippe," "pneumonia" and "pleurisy."

Pulmonary tuberculosis is rather protean in its primary manifestations but in nearly all cases more or less of the following symptoms are present: An afternoon malaise and slight fever, gradual loss of weight and strength, anemia, fast pulse, slight hacking cough, pain in the chest, hoarseness, hemoptysis and often a syndrome that fits our conception of neurasthenia.

A patient with a quota of the above symptoms should strongly suggest to us the probability of tuberculosis and all diagnostic aids should be applied to definitely establish the cause. If, on physical examination, we outline the apices both anteriorly and posteriorly according to the field of Kroenig, and find a portion of the upper lobe involved (for tuberculosis commences here in most cases), as shown by muscle spasm, slight dullness, impaired respiration, generally in shape of prolonged expiration or bronchovesicular breathing, increased transmission of whispered sounds, even though there be no rales, we can be morally certain, if the clinical symptoms fit, that we are dealing with an incipient infiltration. It should be emphasized that the first findings in a great many cases are prominent posteriorly rather than anteriorly and often just below rather than above the clavicle. It should not be forgotten, however, that there is a variable element in the normal findings between the right and left apex which only experience can teach, but such difference never reaches the pronounced changes detailed above.

Until recently the finding of tubercle bacilli was considered the sole criterion for the absolute diagnosis of tuberculosis. Today we have in tuberculin an aid that makes possible earlier recognition. For forty-eight hours the suspected patient, preferably in bed, takes or has an attendant take his pulse and temperature at four-hour intervals. The dubious spot in the lungs is carefully auscultated and findings noted for comparison with changes presenting after the injection of tuberculin. From 0.5 to 4. milligrams of O. T. are given subcutaneously, depending on the age and robustness of the patient. In children below the age of six the skin reactions of Von Pirquet or Moro are generally used instead of the subcutaneous test. Failure to react to 10 milligrams of O. T. bespeaks absence of tuberculous infection. However, in certain very active advanced cases where the resistance to the spread of infection is very low, and in certain very mild infections of slight extent, where the virulence is not enough to call forth a large number of antibodies, no reaction may occur; but all these represent a negligible number of cases. While there may be this percentage of error on the negative side, a positive reaction is always specific for tuberculosis. A diagnostic dose of tuberculin should give a general, a local and a focal reaction. When the patient complains of a decided malaise and there is a rise of temperature and acceleration of pulse usually beyond ten beats in the following eight to thirty-six hours, a reaction has occurred and we can say that somewhere in the body there exists tuberculosis. The focus in the lungs is now examined keeping in mind the previous findings before injection. If there are now rales or the previous rales are increased and in general there is evidence of an activation at the point, often shown clinically by increased cough and perhaps slight dyspnea, we can be sure the focus is tuberculous.

Another aid in early diagnosis of growing importance is the preliminary treatment of sputum with antiformine. This enables the spreading out and staining on an ordinary slide of all the bacilli which may be present in five cc of sputum. The technique, of which there are many unimportant modifications, is as follows: Ten cc of sputum are taken and mixed with an equal quantity of 50 per cent antiformine. The mixture is now brought to a boil and if the antiformine is potent all the mucus is dissolved and

a clear lumpless solution results. To 10 cc of this mixture is now added 1.5 cc of chloroform reagent which consists of one part chloroform and 9 parts of 95 per cent alcohol. After shaking the mixture it is rapidly centrifuged for three to five minutes. This leaves a compact layer of sediment which is spread out on a slide, and, after a little albumin fixative or original sputum is added, stained in the usual manner.

For a time it was thought that the sputum albumin test, introduced from France, would definitely eliminate the possibility of tuberculosis from clinical cases of bronchitis and asthma and thus take a prominent place in differential diagnosis. If the sputum failed to show an albumin reaction it was thought that tuberculosis ipso facto could be excluded. If positive the test would mean no more than that the lung parenchyma had been invaded by some disease process such as pneumonia, tuberculosis or abscess without defining which. Further experimentation has greatly limited the utility of the test and practically thrown it into discard. Many undoubted cases of bronchitis were found to give a positive test and negative reactions were obtained in many bacilli proved cases of tuberculosis. The test is simple. To 5 cc of sputum 5 cc of distilled water and 1 cc of glacial acetic acid are added. This is subjected to several agitations during the course of twenty minutes. It is then filtered and the ferrocyanide or one of the other popular albumin tests performed. The test, as was said, is of little value and is only mentioned that its present status may be placed before you.

The urochromogen test of Weisz is a test somewhat similar to the diazo reaction. It represents a catabolic reaction of the urine and in its application to tuberculosis offers a better indicator of the progress of the disease than fever and other clinical symptoms which the patient manifests. A repeatedly positive urochromogen reaction is interpreted as a bad omen. A constantly negative reaction means a good prognosis. To perform the test two small test tubes are taken, one of which is to be used as a control. Into each place one ccc of urine and 2 cc of distilled water. To one of the tubes add three drops of a 1 to 1000 potassium permanganate solution and compare with the control. The appearance of the faintest yellow is interpreted as a positive urochromogen reaction. Although much work must yet be done to place beyond denial its prognostic value, the reports of experiments so far conducted demonstrate it as possessed of immense value.

When roentgenology is considered in relation to pulmonary tuberculosis we find it only of auxiliary importance. In children it may bring out clearly the bronchial glands about the hilus of the lung. Areas of increased density when read in correlation with physical findings predicate calcified foci. In the demonstration of advanced findings, of fluid, cardiac displacement and as a guide in the induction of pneumothorax it is of preeminent importance.

In the field of therapeutics the two things which loom largest are the administration of tuberculin and the production of pneumothorax. While all students of tuberculosis have not been entirely won over to the use of tuberculin in pulmonary localizations, their number has so diminished that today they constitute a very small minority. It is claimed for tuberculin by conservative users that it hastens the arrest of the disease, that, except in the very active cases, it produces an almost immediate betterment of symptoms, and that it tends to prevent subsequent lapses by the patient owing to the production of a high resistance. The statistics from such men as Sahli, Trudeau and Pottenger are convincingly eloquent. Some authorities claim that even in active advanced cases its administration in suitable doses, while it does not prevent an ultimate fatal result, neertheless adds to the patient's fighting powers. Whatever we may think of it in active advanced cases, there can be no doubt but what it is indicated in incipient lesions, in subsiding chronic ulcerative and fibroid cases, as far as the lungs are concerned.

When we come to the actual administration of tuberculin two schools of thought address us for recognition. One championed by Wright holds to the administration of gradually increasing small doses for the purpose of increasing the patient's opsonic index. The other school is more bold. Its guide is the patient himself and its purpose the production of a mild but not excessive inflammation about the tuberculous focus. If the patient's cough is aggravated or he suffers appreciably from dyspnea, nervousness

or other signs of marked general reaction, if there is a marked local reaction at the site of injection, or if on physical examination there is a marked activation of the focus, the dose is not increased for the time being. Often devotees of this system drop back and rapidly increase up to the same point again, at which time the patient will usually be able to stand further augmentation. According to the extent and activity of the lesion the time of appearance of the first intolerable dose will vary; and according to the length of time it takes the signs of reaction to subside the interval between injections will vary. For instance, a dose of tuberculin is never administered before the local reaction as manifested by redness and nodularity has cleared up and this time is practically never longer than ten days or two weeks. The advocates of the second school claim that any effective healing about a tuberculous focus is accomplished only by the production of an inflammation immediately about the focus. Small doses remote from the capability of producing this disturbance are of little avail till they reach the point where a mild tissue inflammation is effected. Notwithstanding the claims of this school the words of Sahli should be carefully considered on this point: "The production of local inflammatory reaction by tuberculin is risky and uncertain, and I am convinced that it is far wiser to avoid, as far as possible, all such local reactions by careful regulation of the tuberculin dose."

According to method of preparation some of the tuberculins contain the intracellular, others the extracellular products of the tubercle bacilli, whilst others again, like the watery extract of Von Ruck, are a combination of both. Hence it is very common and advisable to give the patient the benefit of both. A large number prefer to commence with O. T. and after a time replace it with B. F. of the intracellular type.

Occasionally there occurs after the administration of tuberculin a severe syndrome similar to that which is known as serum disease. Experienced users of tuberculin seldom see this hypersensitiveness. It is found for the most part where small doses are given at rather long intervals. When this reaction occurs tuberculin should be stopped entirely for about a month and then recommenced with larger increases in the individual doses and given at intervals of not more than ten days. If this does not accomplish results a new preparation, for instance the bacillus emulsion, should be substituted.

I cannot leave the subject of tuberculin without referring to the bright rays of hope emanating from the brilliant work of Webb and Williams of Colorado City. By means of the injection of living tubercle bacilli of definite number and attenuation they are able to produce a marked degree of resistance in animals and humans. For instance, they can keep in confinement monkeys long past the time when ordinarily they succumb to tuberculosis. Some humans have been injected and they do not seem to contract tuberculosis when exposed to conditions which are ripe for producing it. Hence the day seems not far distant when the immunity of humanity may be artificially established on the basis of this work.

The induction of pneumothorax, an operation brought prominently forward by Forlanini, Murphy and Brauer, represents another advance of undoubted value. It rests upon the well-known principle that an organ at rest will heal more quickly and completely than if in action, as witness tuberculosis of the spine or knee. To compress the lung nitrogen, the least absorbable and noxious of our gases is slowly introduced into the pleural cavity. Compression should be maintained for from six months to over a year by injections which are separated by longer intervals as they are repeated. Even after compression has been present for a long time, practically the full degree of expansion will return. Care should be taken that the entering needle penetrates no farther than the pleural space and that there is present a negative pressure with oscillations previous to the inlet of gas. The first injection should not be allowed to reach a positive pressure but the degree may be gradually raised in succeeding administrations. For safety in this procedure an attached manometer is indispensable. A pleural effusion is reported to occur in the most careful hands in about 10 per cent of cases, but this should cause no alarm as at the present time there is a strong movement among clinicians to leave undisturbed pleural effusions unless there is marked embarrassment of breathing or purulency is suspected through chills, very high temperature and marked toxemic symptoms.

All writers are not in accord in particularizing the indications of artificial pneumothorax. Murphy considers it especially applicable to apical or monolobar lesions in an early stage when no extensive unyielding adhesions are present and compression is possible without much difficulty. He does not consider it practicable in the more advanced cases when the amount of fibrosis is extensive. Many cases of threatening hemorrhage have been successfully stopped by pneumothorax. However, not a few consider the operation too radical and severe for incipient cases, but nevertheless there seems to be an increased movement toward its adoption.

In a few instances a condition known as gas embolism or pleural shock takes place, characterized by a sudden pallor, convulsions and perhaps a temporary paralysis. This seems to be due to faulty technique, in particular to the lack of local anesthetic or to the occurrence of too high a positive pressure, which may force air into the blood stream.

A word should be said about tuberculous gravidae who are allowed to proceed to labor. They are a source of widespread infection which seems to be not fully appreciated. As is well known, there is such a marked weakening in their resistance following labor that one-third of tuberculous mothers die within one year thereafter. Many closed cases become open. On account of the large proximity of children and attendants the cases of infection are many. Mothers should not be discharged till all active tuberculous symptoms have subsided. If the patient be at home instruction should be given the family as to prophylaxis. It is estimated that the 75 to 90 per cent of cases of tuberculosis lighting up in early adult life are recrudescences of lesions contracted in childhood. If this is true the need of better care of tuberculous mothers is most urgent.

While it is quite obvious that tuberculosis strikes both where wealth and poverty abide, it inflicts its greatest ravages on the poorer proportion of our population. It takes a long time for a patient to return again to society as a working unit, or if return be impossible, he needs care on a large scale for himself and family. It is at once evident that the community must take hold to care for such cases and secondarily by means of public education, by examination of contacts, by urging the periodic inspection of workers in their shops and children in their schools and by asking that places of living and employment be kept sanitary and well ventilated to endeavor to stay the onslaughts of the White Plague as it marches through the ranks of our civilization, leaving in its path wide trails of financial paralysis, physical disability and soul disaster.

This need in Chicago has been met by the establishment of the Municipal Tuberculosis Sanitarium. It maintains a staff of about 35 physicians, 55 nurses and 10 examining centers situated in the various congested districts. Cases, especially open ones of tuberculosis, are sought out, contacts examined and information imparted to prevent further spread of the disease in the home. If positive cases are found they are treated at the dispensary or at sanitaria as the circumstances warrant. In a short time a 900-bed institution will be open for tuberculous cases and maintained by the city of Chicago. Through associated agencies such as the United Charities, the County Agent, Elizabeth McCormick Memorial Fund and the Chicago Tuberculosis Institute, much needful assistance is given in the shape of food, tents and the establishment of open window school rooms. The Municipal Tuberculosis Sanitarium aims to work in cooperation with private physicians and solicits their aid to the end that the arch foe of mankind may be effectively checked.

6429 So. Halsted Street.

PREVAILING MISTAKES IN THE ANTI-TUBERCULOSIS MOVEMENT.*

GEORGE THOMAS PALMER, M. D.
SPRINGFIELD, ILLINOIS.
President of the Illinois State Association for the Prevention of Tuberculosis; Director of the Springfield Open Air Colony.

We have now come to a place in the crusade against tuberculosis where those interested in the work may well take stock of past accomplishment; where we may very properly raise the question as to whether the lines we are pursuing are the ones which will bring us most directly to the solution of our enormous problem.

Certainly enough has been accomplished to repay those who have given their thought, their

*Read before the section on Public Health and Hygiene of the Illinois State Medical Society at Decatur, May, 1914.

labor and their money to the fight; enough has been accomplished to warrant much greater and more general effort in the future.

Vaughan declares that, since the discovery of the tubercle bacillus, in 1882, tuberculosis has decreased 54 per cent, while the National Association for the Prevention of Tuberculosis holds that the decrease during the decade ending 1910 was 18.7 per cent.

Still, experience has demonstrated that many of our methods are faulty. If we are to attain the maximum of success there must be a radical revision of the program.

For generations pulmonary tuberculosis has been a dead subject. The attitude of the rank and file of the medical profession has been and still is exceedingly pessimistic about it. And this pessimism and hopelessness have led to a peculiar neglect of the disease not only among active practitioners, but in the schools of medical instruction. The physician who is up to the minute in his information relative to typhoid fever, appendicitis or leukemia, is often peculiarly lacking in the knowledge of first principles of the diagnosis and treatment of tuberculosis.

Within the past few years, the subject of tuberculosis has been tempered with more optimism. The results of proper treatment in cases diagnosed early have been encouraging in the extreme. Yet, so far, this optimistic tendency has not succeeded in penetrating the general apathy of the profession in regard to this particular disease. By the vast majority of successful physicians, tuberculosis is still regarded as a field quite unpromising and, hence, signally uninteresting.

The awakening of the spirit of cheerfulness and enthusiasm in the field of tuberculosis is one of the spectacular pages of medical history. In salutary results, it promises as much in the saving of human life as the development of aseptic surgery. It is not surprising that this suddenly awakened enthusiasm should have carried us into some unwise actions and some indiscretions. These have had their effect; but the warfare against tuberculosis has but begun and there is ample time for consideratiion and readjustment.

The pioneers in the anti-tuberculosis movement laid great stress upon the infectiousness of the disease. With a fervor which is commendable, the early educational campaigns carried this phase of the subject far beyond the bounds of reason. Conservative physicians were swept quite off their feet and the pest house was regarded as preferable to the tuberculosis sanatorium as a place of safe residence. This extreme view is now generally abandoned, but the tuberculous patient is still a most unwelcome visitor to the reception rooms of many doctors.

But the deplorable results of this extreme teaching are being visited to-day upon the already unfortunate victims of the disease. In his work, his play and in his every-day life, the consumptive is still being made an outcast. Through unreasoning fear, he is dropped from the payrolls when he needs his pay most. It is a matter of the utmost difficulty for him to secure employment. The man who is so fortunate as to have an early diagnosis, is shunned by his perhaps equally infected companions.

If we recognize that tuberculous infection is almost universal; if we realize that the borderline between tuberculous infection and tuberculous disease is at times so delicate and evasive as to baffle the most accurate diagnostic skill; we must see the tragic absurdity of our present phthisophobia and the necessity for a radical readjustment of our views.

If the pioneers descended to the very depths of despond when they dealt with the infectiousness of tuberculosis, they rose to glittering and unwarranted heights when they preached its curability. Without consideration for the disappointment which must follow such doctrines, the cure of tuberculosis was pictured as alluringly easy. A cow, a few hens and an out-of-door sleeping porch were the simple means by which the disease was to be vanquished.

To be able to announce that tuberculosis is a curable disease was a wonderful thing; but we were not content with that. We became unreasonably optimistic. We forgot that we were dealing with one of the most serious of all diseases and preached a sort of slip-shod "back-to-nature" program that could end in nothing but failure and disappointment.

We forgot that rest is as important as fresh air; that good nursing is as essential as food. Thousands of unfortunates were urged to "Go west and rough it" or to "get out of doors and exercise."

Such advice brought disappointment and lack of confidence; and such disappointment brought prosperity to the charlatan and patent medicine man.

Tuberculosis is a social problem as well as a medical problem. Without the social worker and the layman we never should have progressed as far as we have. The essential truths of the prevention and cure of the disease must be carried into every home, into every school and into every factory before we can win a genuine victory. This educational work can be carried on perhaps more effectively by the nurse and the layman social worker endowed with the peculiar gifts essential to popular educational work.

But the lay worker and the nurse must look to the medical profession for the correct showing of facts, and I am impressed that the great mistake in the campaign so far has been in not impressing the physicians of the nation with their responsibility in this medical-social work.

True, physicians of the highest class have engaged and do engage in the anti-tuberculosis movement; but the number actually interested or awake to the true aims and purposes of the work is singularly small.

In some way this must be readjusted. The medical profession must become an active force. They must be enlisted in the movement and must be induced to work along a definite and coordinated plan.

On account of the previous apathy in regard to the subject, accurate, early diagnosis of tuberculosis is a rare art. Detection of the disease in its incipiency is unusual and what is most astonishing is that even now the diagnosis of early tuberculosis is neglected in many excellent medical schools.

The large group of cases cited by Dr. E. A. Gray of tuberculous patients who had each passed through the hands of several physicians with the disease unrecognized, is depressingly significant.

On account of this same pessimism, perhaps, the lack of interest in the relative value of climate in the treatment of tuberculosis persists. Without entering upon a discussion of this unsettled subject, it must be admitted that climate is of secondary importance as compared to proper care, nursing and medical supervision and that consigning all classes of vague and indefinite cases to the "west or southwest," without provision for proper sanatorium or medical care is as unscientific as it is unsuccessful in results.

Even if it were admitted that one climate has definite advantages over another; even if we waive the signal disadvantages of sending the sick man far way from home with the accompanying homesickness, financial burden and hardship, it must be admitted that an encouragingly large number of persons are restored to health by sanatorium care in Illinois. And, we must recognize that for certain social and economic reasons wholesale exportation of tuberculous patients is as impracticable as it is unnecessary.

Hence, our educational campaign, has been directed toward securing public sanatoria in Illinois, such as are in succesful operation in neighboring states. Whether they should be state sanatoria or county sanatoria has been the center of absorbing controversy; whether there shall be any public sanatoria in Illinois seems the more important question.

In 1913 there were considerably over 6,000 deaths from tuberculosis in the state, giving an estimated tuberculous population of 60,000. Aside from Cook County there is no public provision for the tuberculous in the state. The total capacity of the private sanatoria—some operated almost at cost—is 350 beds. And the astonishing and significant fact is that frequently many of these beds are vacant.

Since the passage of the Glackin Law, several communities have voted to establish sanatoria. None except the Chicago Municipal Sanitarium has materialized.

This would indicate that we have gone forth urging the establishment of sanatoria before we have educated the people as to the crying need for sanatorium treatment. Pitifully inadequate as they are, Illinois is not yet utilizing the sanatorium facilities which private philanthropy has provided.

Briefly, the program of the future must embrace these changes:

1. A saner and less hysterical conception of the infectiousness of tuberculosis.

2. A more conservative attitude toward the easy curability of the disease.

3. A general recognition, both by physicians and laymen of the necessity of early diagnosis and the difficulty of early diagnosis.

4. A sounder appreciation of the advantages and the disadvantages of the "quest for ideal climate."

5. A broader knowledge of the successful treatment of the disease in Illinois.

6. A recognition of the need of sanatorium care as an educational as well as a curative agency.

And above all the realization of the part which the medical profession must play, not only in giving the scientific truth as the basis for the movement, but in educating their own following and the people of their communities as to the importance of these essential things.

THE RELATION OF TUBERCULAR INFECTIONS TO GYNECOLOGICAL AFFECTIONS.*

A. J. Butner,
HARRISBURG, ILL.

The subject of this paper was suggested to me or was rather thrust upon my inexperienced observation by recurring diagnostic errors which might have been as easily omitted as they were thoughtlessly committed. And by permission of my associate, to whom I shall have occasion to refer later, I desire to enter jointly for ourselves a plea of guilty; believing, however, that ours are not individual, but are common errors, too frequently indulged in by the busy doctor.

The reference of guilt to which we here plead is that of mistaking a symptom for a disease and treating that symptom as a pathological entity instead of recognizing it as only a part of a morbid whole. In this light I shall presently attempt to speak of the relations of tubercular infections to gynecological affections. The conditions just referred to I believe to be due, not to our ignorance of scientific investigation, but to conclusions formed from too hasty examinations or in some extreme cases from the impromptu statement of the patient herself that she is suffering from a malady which she chooses to designate as female disease and desires our attention along a certain well defined line which she or her relatives do not hesitate to outline and which we as unhesitatingly attempt to treat.

But before proceeding permit me to state that I do not use the term female disease with any definite or scientific meaning. In fact, I am not aware of it if it has any such meaning at all, although it is often so used by the laity. But this I do know, as many of you probably do from your experience in life insurance examinations, that when the cause of death of a wife, mother or other close female relative is given by the applicant for insurance as, just female disease, unqualified by cancer, tumor, miscarriage, blood-poisoning or other such term equally familiar to the laity, close questioning will many times elicit a definite history of tuberculosis.

So often do I find this to be true that I regard the term as suspiciously synonymous with tuberculosis in such cases until otherwise elucidated. And, pardon me if I err, I am beginning to look with suspicion on all gynecologic cases presenting between the expected ages of puberty and the beginning of the climacteric as having a tubercular contingency, without a definite history or findings to the contrary. Especially do I feel my apprehensions well taken in cases where the morbid physiology overshadows the morbid anatomical findings and in attempting to treat such conditions I often find myself suddenly brought face to face with the fact that I am no longer regarding a gynecological disease but a gynecological symptom of a constitutional disease,—the etiology or pathology of which I have little or no definite idea.

The relation that tuberculosis bears to the proper functioning of any organ or system of the body is not always a comprehensive one; especially is this true of the generative system of the female. Although we have long since admitted the toxin theory as a causative factor in much of the gastro-intestinal disturbances of tuberculosis such as anorexia, constipation, diarrhea, nausea, vomiting and abdominal pain, we have stopped short of the possibility of applying the same theory in explaining as equally plausable disturbances in function of the female reproductive system such as, delayed, retarded, and irregular menstruation,—scanty, suppressed, and continued flow or painful periods with undue pelvic discomfort and backaches that become chronic, continuous and intermenstrual.

The analogy here drawn I think is apparent and the references are made being fully aware that many and divers other causes may be and are chronicled as acceptable theories for these

*Read before the Southern Illinois Medical Association Nov. 5, 1914.

pathological symptoms, but it is only fair to state that the frequency with which they do occur in known tuberculous women is sufficient to warrant a thorough investigation by history and physical examination, especially of the respiratory and lymphatic systems of all gynecologic cases presenting between the expected ages of puberty and the climacteric, before assigning them to other realms of etiology. I may further add that a blood examination and a cutaneous tuberculin test with a blood pressure reading will not only facilitate clearing many obscurities in making a proper etiological arrangement of such symptoms but is often imperative in establishing the relation between the symptom observed and the morbid condition of which that symptom is only a part.

As has been previously stated, the toxin theory is generally accepted as plausible in explaining the gastro-intestinal disturbances of tuberculous patients such as anorexia, etc., but the absent, delayed and scanty menstruation of the pubescent tuberculous girl is as generally attributed to a conservative act of nature which is in our opinion to say the least empirical thinking if not an assumption entirely void of scientific truth. For if nature be such a strict conservator of energy to deny womanhood to the tuberculous pubescent at the small cost of the catamenia she certainly would not be so neglectful of the ruinous waste in the process of digestion and assimilation in the same subject.

Hence we can see no objection in, and we think good reason for assuming that the menarche of the tuberculous girl is delayed or wanting not because of an economical anabolism or conservatism of nature, but rather from a katabolic toxin being elaborated by the growth of the tubercular bacilli having a selective action in some unknown way over menstruation, probably by the influence of the toxin on the internal secretion of the ovary, which in our opinion is the most acceptable theory yet offered for the explanation of the catamenia.

We do not desire here to offer a thesis on the cause and effect of menstruation and ovulation, but only to call your attention to the marked contrast in development between the non-tubercular pubescent and the tubercular girl, who has arrived at or past the expected age of puberty.

On the one hand we see a sudden and wonderful transformation, both physical and psychical, by some internal agency or power previously unknown to the physical economy of that individual. The pelvis enlarges, the limbs round out and the angularity of the body is replaced by graceful curves. The general carriage and manner of the girl rapidly approach a state wholly feminine. While on the other hand we see her counterpart lagging through her teens with a form and physique that is sorrowfully childish if not neuter in character.

She has halted at the parting of the ways of the sexes. She has been deprived of that internal stimulus elaborated by the second function of the ovary or had it neutralized by the toxin of her enslaver, the tubercle bacillus, which is attempting to dispossess her of her sexual heritage.

This is the picture of the tubercular pubescent most commonly seen, but is not by any means exclusive if persistently and systematically sought for. I have more than once been consulted by mothers for their daughters entering puberty with profuse and continued menstruation for one or two weeks with no other indication of ill health until diligently sought for by a careful and rigid examination. So frequently in such cases have I found evidence of concealed tubercular foci that I have ceased to treat the gynecological symptom as coincident to a tubercular infection elsewhere but as part of and as corroborating that morbid whole. Hence I have long since despaired of compromising such symptoms with the theory of conservatism of nature in explaining delayed, suppressed and scanty menstruation in tubercular patients as well as the theory of vicarious menstruation which I believe to have root in tuberculous hemoptysis with suppression of menses for the same reason.

Nor is it only in the menarche that we may find the subtle touch of this mischief worker, but continuously on through the menacme up to the menopause does he beguile us in varied and divers ways so ingeniously concealed that the most careful of us may fall victim to his intrigues. In fact so difficult are the gynecologic symptoms arising from tuberculosis during the menacme or child-bearing period of woman to separate from other conditions depended upon marital relations such as pregnancy and the consequence incidental thereto, venereal and other infections, that for the sake of brevity I shall devote the remainder of this paper to case readings of my own and associates who have been liberal enough to fur-

nish and for which I feel deeply indebted. The cases selected are not the unusual but the common ones and are chosen in accordance with the subject of this paper. In the report of these cases no chronological arrangement will be observed, but only symptoms cited with results and conclusions therefrom.

Case 1. The first case that I will relate came under my observation when I was yet a medical student; and was a patient of Dr. J. H. Rose, with whom I was later associated in practice.

She was 26 years old and the mother of three children and had always enjoyed good health. Had normal deliveries with no complications in the puerperium. The youngest child was two years old and a pregnancy had not since occurred. There was no history of a venereal infection nor any symptom suggesting such. On her first presentation to Dr. Rose for his professional services I desire to plainly state that there was nothing in her appearance to suggest a tubercular infection and I must frankly admit that there was no such suspicion lodged by either of us, in fact nothing was further from my mind at that time.

The history given by her riveted our attention within the pelvis and, sad to say, we could never get out of it nor surmount the difficulty despite the fact that with internal, bimanual and other combined examination which the female pelvis is forced to undergo there could not be found a sufficient morbid anatomy of structure or relation of the pelvic contents to explain the morbid physiology of which she complained.

Her monthly periods, which had always been regular almost to an hour and of the twenty-eight day type, had since her last confinement become irregular and occasionally absent. The flow, which had previously lasted for four or five days, had occasionally became suppressed with a sudden stoppage at only one or two days' flow. The normal period of depression and discomfort had become greatly exaggerated in point of both severity and duration until she was scarcely ever free from it and which at times amounted to severe pain in the back and a sense of unbearable pelvic weight.

You will probably ask here for our diagnosis. What treatment was instituted and what were the results?

I shall answer the last first by stating that for the patient's benefit the results were only too gratifying, which gave her false hope and lost much valuable time for her medical advisers.

She improved, yes, temporarily, so far as her symptoms were concerned, but the fountain-head supplying those symptoms was higher up and had, needless to say, never been reached by our therapy.

As for the treatment, it was, needless to say, that usually applied in such cases, and consisted locally of boroglyceride tamponade and hot vaginal douches of creolin. The systemic treatment consisted of the so-called uterine tonics of viburnum, cimicifuga, gossypium and others I fear equally void of potency so far as reaching the seat of the disease was concerned. But the symptoms did ameliorate in response to, or in spite of, our therapy, but which I shall leave for you to decide.

Now, as to the diagnosis; this was entirely tentatively held by us for several weeks, yes, months, until at an office visit there arose for our consideration another question, foreign we thought to the one by which we had been previously engaged; that was one of a severe cold that the patient had contracted in the fall and early winter and which persisted in hanging on with more or less chest symptoms.

So, after this examination, there was not much difficulty in associating all symptoms and cleaning up the perplexities of pelvic findings, or rather the absence of such findings, and transferring the seat of disease from the pelvic to the thoracic cavity.

Case 2. Another case coming under my observation a short time after I had entered practice made an impression that I shall not soon forget.

I was first consulted at my office by the patient who had a history of a rather profuse and continuous menstruation for the last six months and which seemed to grow worse. An examination was made of the pelvic viscera with negative results.

She was twenty-six years old and had borne two children. Her labors were normal, but she had aborted once previous to her first labor at term. All other history was negative as well as the finding on examination.

I dismissed the case with the assurance that there was nothing about which she should be alarmed. Following this examination I was occasionally informed by the husband that the symptoms were not improving but were growing decidedly worse. Finally I was called to the home, where I found the patient suffering, as had been suggested to me by the husband, with a severe uterine hemorrhage. I immediately made an internal examination, expecting to find part or all of a dislodged ovum, but failed to find even a trace of decidual shreds.

I tamponed the vagina and returned in eight hours to find nothing but clots behind the tamponade. The tamponade was repeated with the same results except the flow had abated; and three or four days in bed resulted in her recovery.

This experience was repeated for three successive months with the exception that the hemorrhage grew less and by the next three months had ceased altogether. Then I was again consulted for suppressed menstruation and again thinking pregnancy possible succeeded in quieting their fears.

After continuing with irregular and absent periods for a while I was approached by the husband concerning vicarious menstruation and on questioning him ascertained that she had on two or three occasions spat blood.

Then I became aroused and through some pretext or other obtained permission to re-examine my patient, which I did, manifestating as much zest in the chest examination as I had previously in the pelvic investi-

gation and with much more reward, I am sorry to say, for my efforts.

Case 3. I am indebted to Dr. R. B. Kane of Raleigh for the following case, which very graphically illustrates the point under discussion.

A patient who consulted him for what she chose to call "nervousness" was thirty-eight years old and the mother of four children. She had always had normal deliveries with the exception of a second degree laceration which was not repaired.

There had been no impairment in function of the reproductive system until about a year before consulting the Doctor for the condition just named, when a leucorrhea appeared, which was at times very annoying. Soon after the appearance of the leucorrhea the menses became much more profuse and at the time were appearing semi-monthly, instead of monthly.

There was no history of pelvic inflammation or venereal infection nor any evidence of such on examination. In his subsequent attendance Dr. Kane ascertained that there was a temperature of 99 to 100 degrees for a few days at each catamenial flow, which gradually became more marked in duration until it became continuous.

Dr. Kane informs me that this case has now reached an advanced stage of pulmonary tuberculosis and in the absence of any anatomical pelvic findings a profuse semi-monthly menstrution continues.

Case 4. A case of Dr. C. W. Turner with a history of suppressed menstruation for several months was at first thought to be a pregnancy but later a cystic tumor of the ovary. She finally came to the operating table for an exploratory laparotomy, which was performed and which revealed a tubercular peritonitis with effusion. She later revealed advanced pulmonary lesions to which she succumbed one year later.

In this case there was nothing tubercular about the appearance. Her nutrition was above par and any examiner not making a chest examination a routine might easily have omitted it here.

Case 5. Dr. E. W. Cummins relates a case of a Lithuanian woman consulting him for a severe and intractable dysmenorrhea with nothing pathological about the pelvic contents. This condition had followed a wetting and a cold as she would have it and she demanded of her physician medicine that would relieve the pain and produce a regular and normal flow. A chest examination, I am told, revealed evidence of incipient tuberculosis.

These and similar cases could be indefinitely repeated, but are not needed to complete this lamentable chapter in the record of my experience as well as in that of others with whom I have been closely associated in practice and who have been honest and conscientious enough to impart their failures as well as their successes.

So in conclusion I desire to briefly state that often much more valuable information concerning gynecologic affections may be found in the thoracic than in the pelvic cavity, and that no gynecologic examinations is complete that does not take the lungs into consideration.

DISCUSSION.

Dr. Wm. F. Grinstead, Cairo: I think we should not lose any time in hesitation as to the discussion of a paper which is so practical and so timely as the paper that has just been read. I say that it is practical and it is timely. It frequently occurs in the office of the physician that a mother brings her daughter for treatment for amenorrhea. She expresses her alarm that if this amenorrhea is not corrected promptly her daughter will go into consumption. This is a very common occurrence in the physician's office, and every one here can testify to that. It becomes necessary for the doctor to explain to these people that the amenorrhea does not cause tuberculosis, but that the patient, or the patient's mother, has the cart before the horse, that tuberculosis itself causes amenorrhea.

When one of these girls comes to the office, there are two causative elements that occur to the mind of the physician at once. One is the possibility of pregnancy, which is usually easily excluded, and the other is tubercular infection. Now, people should not be permitted to believe that the amenorrhea is causative, but they should be always instructed that it is an effect, absolutely, and those patients should be carefully examined for tubercular infections. These infections may involve the sexual organs themselves; they may be in some other part of the body and, as we know, most commonly are in the lungs. I am reminded in this connection of another thing that I believe is often overlooked; it is the causative element in tubercular peritonitis. There is no doubt but many of these cases of tubercular peritonitis in females originate from tubercular disease in the tubes. The fact has been explained by some of our leading gynecologists that the making of a small opening into the abdomen in tubercular peritonitis, mopping it out, closing it up tightly without drainage gives a cure in many of these cases, by the supposition that tubercular tubes have their fimbriated extremities kept open by the fluid that is usually poured out into the peritoneal cavity, and that when this fluid is mopped out and the tube and its fimbriae cease to flow, the lumen and the fimbriated end collapse, become sealed up, and the tubercular infection of the tube is shut off from the peritoneal cavity. It is well to remember that many of these cases of tubercular infection that have been referred to by the essayist have the infection located in the tubes or possibly in the ovaries.

Dr. E. E. Edmonson, Mt. Vernon: The importance of tuberculosis we know is growing more and more on our consciousness, and I would like to suggest that the early use of tuberculin as a diagnostic agent in these cases might give us

some light on the subject at an early date, also that we look well to the avenues of infection. This is especially true of the tonsils. You do not expect any but a throat man to talk about tonsils, but we have a great many men who are specialists on diseases of the chest that now look first to the tonsil, and if there is a tonsil they have it removed. The great physician of Chicago, Babcock, has every tonsil removed where he has a case involving an endocarditis or an incipent apical tuberculosis. I would emphasize, then the diagnostic test of tuberculin, which is regarded as fairly positive, (and I would suggest that because it is easy to administer and the results are typical); also to look for the avenue of infection and remove it.

Dr. A. J. Butner, Harrisburg, closing: I do not know that I care to add anything except to emphasize what has just been said of the tuberculin test. As mentioned, I think that in gynecological examination that it is not positive—it may come from some other source, and the cutaneous tuberculin test should be omitted—but, as the doctor has just stated, it will often show us that there is a tubercular focus somewhere. I might add that the examination of the throat and the tonsils is no less important; while it is out of the way of the general practitioner, he can soon become sufficiently versed with the appearance of the tubercular throat or tonsil so that he can tell if there is a focus there or, at least, if it appears suspicious.

IMMUNITY IN TUBERCULOSIS.*

W. H. Watterson, M. D.
WAUKEGAN, ILL.

Specific antibacterial immunity is the power of the living organism to cause the disintegration of the related bacteria when they enter the tissues including the blood, fitting them thereby for appropriation as food and for elimination.

The *success* of immunity depends on the *ability* of the body cells to produce sufficient specific anti-bodies in response to the stimulus of inoculation, and the ability of the circulation to convey these specific anti-bodies to the area of infection. Immunity is a relative matter. It differs with individuals, also with infections. There must be some natural immunity, or the child would show clinical manifestations at the slightest initial infection. But instead the bacilli are destroyed and going into solution form a stimulus which produce through the body cells added specific anti-bodies or immunity against a much greater future infection. Now, if this primary infection or any further infection be greater than the natural or excited immunity can withstand, or if the body cells are unable to produce sufficient anti-bodies in response to the stimulus, there results clinical manifestations of the disease.

We may measure specific anti-body formation, comparing the number of bacilli taken up by the leucocytes in tested blood with that in normal—Wright's opsonic index. We, therefore, seem to have a positive means at hand to produce sufficient immunity, could we measure the stimulus (infection), and if we are assured that this immunity will reach the infected area. The latter cannot be expected in far-advanced cases with walled-off areas, nor in non-vascular tissue, but even here a high degree of immunity is of great importance, as it protects healthy tissue. Therefore, except in advanced cases, the only uncertain element, the one not under our control, is the stimulus (the infection, not only in amount, but also its virulence).

The ideal would be *no infection*, but since Nägeli in 500 autopsies at Zürich found that 98 per cent presented evidence of tuberculous infection at some time during life; as later observers, including Jaboci, found 30 to 40 per cent. of children in villages where tuberculosis had not existed for years, to react to tuberculin test; and since an average of the findings of Burckhardt in Dresden, Von Pierquet, Römer, Hanberger, H. Albrecht and Cohn showed over 90 per cent. infected before the age of 16, and since it is now conceded that tuberculosis is an infection contracted in childhood and rarely in later life, we cannot hope for the ideal as long as immunity is not procured prior to or soon after infection occurs.

Von Ruck and Achard's article in *Pediatrics*, December, 1913, may well be quoted in part at this time: "We believe, therefore, that in the human race a specific resistance, either transmitted or acquired, though often inadequate, is, as a rule, already present and that this accounts for the complete resistance to tuberculosis in some persons, and in others for the presence of latent tubercle bacilli without lesions in various tissues, for the spontaneous healing of minute and localized foci found so frequently on autopsy after death from other diseases, as well as for the chronic course and the tendency to recover in cases in which the disease has declared itself."

*Read before the Waukegan Clinical Club, Jan. 4, 1915.

The amount of infection depends on the intimacy and duration of contact with the bacilli; the whole anti-tuberculosis campaign is being waged on this fact. Comparatively few show clinical manifestations of tuberculosis prior to the age of 16; before the age of life strains at wage-earning and child-bearing. As previously intimated, clinical manifestation is evidence of insufficient immunity to withstand the infection. While slight infection in early childhood is not desirable, yet, if it occurs, it gives added immunity resulting from that infection; *but* there is danger in infection as the amount and virulence of infection is not under our control, even with all anti-tuberculosis measures.

Now, if a substance could be produced that could, under our control, *stimulate* these specific anti-bodies and not put the patient in jeopardy, as with infection, measuring the stimulus and the results by Wright's Opsonic Index and a clinical study of *each* case, we could obtain a degree of immunity that would withstand any degree of infection.

Koch's O. T. attempted this, but, besides "the-more-the-better" idea which threw it into disrepute, it lacked certain elements of the bacillus necessary to produce specific anti-bodies.

Other tuberculins attempted adding other of the elementary parts of the bacilli, but all processes of making spoiled some essential substance, either by heat or filtration or growth. Then came Friedmann, producing avirulent bacilli by its growth in the cold-blooded reptile, but the recurrence of the virulence, after injection into the human, was so probable and the results so unsatisfactory, that it was not accepted.

The oldest American investigator of this subject, Dr. Karl Von Ruck of Asheville, N. C., insisted that we must produce a stimulus that contained *all* the *substances* of the *bacillary bodies*, including an excess of extracts stimulating fibrosis, while the caseating extractives are removed.

His efforts to produce such a substance was reported in the Therapeutic Gazette, June, 1897. Lately, he has produced a more perfect substance, known as "Dr. K. Von Ruck's Vaccine Against Tuberculosis." With this vaccine he has immunized guinea pigs, "all the controls showing generalized tuberculosis, whereas, all the animals infected with tubercule bacilli to which immune serum had been added were absolutely free from tuberculosis."

Unfortunately, when investigation was being made of this preparation by the Hygienic Laboratory in Washington, under Dr. Anderson, an epidemic of pseudo-tuberculosis, so common among guinea pigs, was found by Dr. Von Ruck among his own, and then among the Washington pigs. Of course, results of investigations with such pigs would be misleading, and the report was, therefore, not permitted to go to the Senate, for whom it was intended. Later investigations have not been reported from Washington.

Dr. Von Ruck took his vaccine to Europe for investigation. Sir Almroth E. Wright of London, the German University at Prague, the Pasteur Institute of Paris, the Sero-Therapeutic Institute in Vienna, and the Hygienic Institute in Danzig are investigating the serum. Of course the war has delayed much of this work and reports on that which has been done, but a cablegram dated December 2, 1914, to Karl Von Ruck, states that Sir Almroth Wright's laboratory in London advises complete confirmation in bactericidal and immunity experiment.

Dr. C. A. Julian, at the Baptist Orphanage at Thompsonville, N. C., immunized 262 children, and reports some 450 others in his paper read before the twelfth annual meeting of North Carolina Academy of Science, April 22, 1913. His report is so optimistic as to command the attention of every phthisiologist. Dr. H. Longstreet Taylor of St. Paul reported a number of adults and children treated and most heartily indorses the watery extract and later the vaccine now used at his sanatorium.

If Dr. Von Ruck is confirmed in his claim that his vaccine will actually prevent tuberculosis and consumption as Jennerization prevents smallpox, it follows that the general adoption of his method will solve the tuberculosis problem in a single generation.

My experience has been with Von Ruck's vaccine, covering one year, as follows:

As a prophylactic in ten cases, therapeutically in 31 early, 33 moderately advanced, and 15 far advanced pulmonary cases, one scrofulous case, one surgical case, two laryngeal cases, and two pregnant women among the moderately advanced cases.

The prophylactic cases were where direct exposure and contact was intimate and for a long period of time. In every case there was marked improvement

in health, and up to this time no report of clinical manifestations of activity.

The 31 early cases all improved from the first and have remained well since, with one exception, where return to Chicago and a former dusty occupation resulted in a renewed activity, but a slow fibrous type.

Five of the 33 moderately advanced cases had to stop its use on account of marked constitutional disturbances. All the others showed continuous and marked improvement. A notable feature was the change to a fibrous type in many of these cases.

Thirteen of the 15 far advanced cases had to stop vaccine on account of marked constitutional disturbances; the other two took on a fibrous course improved until a recent examination by one of our best Chicago diagnosticians failed to develop any active signs of the disease.

The scrofulous case improved from the first.

The surgical case showed marked improvement during the two months he continued treatment. Since then I have not been able to hear how he progressed.

The two laryngeal cases were most interesting to study. After each injection local reactions were noted. These discontinued; in one case after dose of .5 c.c. had been reached the reaction ceased; ulcerations healed and patient showed evidence of apparent arrest which still, after 4 months, prevails. The other case improved in every way as long as vaccine was given, but four weeks after discontinuing same, an abscess, intra-laryngeal, formed, which became so obstructive that I did a tracheotomy, but this absorption from this abscess was so severe, that he died four days later with every evidence of overwhelming toxic absorption.

The two pregnant women were in the usually critical condition of the pregnant tubercular when they entered the sanatorium, each showing considerable constitutional disturbance. After the routine period of rest after admission, vaccine was started. Improvement was shown in each case from the first, the disease becoming quiescent and remaining so until after the babes were born. Each had a healthy baby, and each is in good condition at this writing.

In similar cases reported by Von Ruck, of children born to immunized mothers, the immunity of the babe was shown by a quantitative complement-fixation test, to be of a much higher degree than that of children born to non-immunized mothers or even healthy mothers.

In all the cases taking vaccine carefully prescribed auto-inoculation treatment was given on all week days and Sunday a. m. The vaccine was given usually in 1/10 increasing doses up to 1 c. c., beginning with .002 c.c. after which each patient was sent to bed for two hours and kept quiet for the remainder of the day, the following day cautiously returning to the auto-inoculation treatment.

I have included some elementary facts, which to the phthisiologist are likely unnecessary, but since this paper is intended for the general profession, I have ventured to include them.

The aim in a vaccine is to stimulate the same specific anti-bodies stimulated by an infection, yet, without producing infection with its uncertain consequence.

The *whole substance* of the bacillus seems essential to this process. This "whole substance vaccine" is produced in Von Ruck's vaccine against tuberculosis.

Since the ideal—no infection—cannot be expected, we can do most by immunizing prior to or soon after infection, or at least before clinical manifestations. Since it is rare to have clinical manifestations before the age of 16, and 90 per cent of infections occur prior to this age, the best time for vaccine treatment is at 16 or before. Other substances, as the tuberculins, lack the bacillary substance, being made up of culture fluid or otherwise in which elements essential to anti-body formation are lacking.

Reports on the immunizing power of Von Ruck vaccine on both animals and human seem very conclusive, and he is having these confirmed by the highest courts of judgment.

I was most pleased with the results obtained in my year's work with it.

Of course, all other measures as used in the recognized sanatoria, open air, rest, and graduated labor, artificial pneumothorax, rational feeding, etc., will always be in use, but therapeutically we seem to have a vaccine aiding in producing a higher and more lasting degree of immunity than was before obtainable. The immunization of the unborn is a new and hopeful aspect.

May we have at hand *the* vaccine that will do for tuberculosis what Jennerization has done for smallpox, and even more the therapeutic means of handling the already developed cases, and, if so, may we *so* carefully use it as to *not* put it into disrepute, as was done with Koch's tuberculin, giving Dr. Karl Von Ruck and his co-workers the credit due them.

REFERENCES.

1. Letter Von Ruck's to Dr. H. Longstreet Taylor, St. Paul Med. Jour., July, 1914.
2. Forchheimer's Therapeutics of Internal Diseases, V, 18 and 19.
3. Tuberculin in Diagnosis and Treatment, Pottenger, pages 57, 58 and 61.
4. Pediatrics, December, 1913, "Specific Resistance in Tuberculosis," K. Von Ruck and H. J. Achard.
5. On Activity Immunity in Tuberculosis, H. J. Achard, Illinois Medical Journal, August, 1911.
6. Experience in Prophylactic and Therapeutic Immunization Against Tuberculosis, Dr. K. Von Ruck.

7. Preventive Vaccine Against Tuberculosis, C. A. Julian, M. D.
8. St. Paul Med. Jour., July, 1914, "Clinical Experiences With Von Ruck's Vaccine Against Tuberculosis," H. Longstreet Taylor, M. D.
9. Dr. R. S. Flack, Spray, N. C.: Reprint of paper read before Rockingham County Med. Society, April 23, 1914.

CHICAGO PLAN FOR MUNICIPAL CONTROL OF TUBERCULOSIS. THE CHICAGO MUNICIPAL TUBERCULOSIS SANITARIUM AND ITS AUXILIARY AGENCIES.

THEODORE B. SACHS, M. D.
President, Chicago Municipal Tuberculosis Sanitarium.
CHICAGO, ILL.

The Chicago Municipal Tuberculosis Sanitarium was created under the provisions of "An Act to enable cities and villages to establish and maintain public tuberculosis sanitariums," introduced in the Illinois Legislature by state senator Edward J. Glackin of Chicago, on January 14, 1908, and passed by the legislature at the same session. The Act provided for a special municipal four mill sanitarium tax, for the construction and maintenance of a sanitarium in any city or village which adopts the provisions of the law by a majority referendum vote at a municipal election.

On March 10, 1909, the legislature passed an amendment, introduced at the request of the Chicago Tuberculosis Institute by Senator Glackin, reducing the sanitarium tax to one mill.

On March 11, the Institute obtained 1,000 signatures for submission of the Act to a referendum vote at the coming municipal election on April 9. The brief campaign for the adoption of the Act by the City of Chicago was most effectually planned and vigorously managed, drawing enthusiastic support of all classes of the community. Of 254,025 voters casting their ballots at this election, 206,640 (81 per cent of the total) voted on the Sanitarium Act. The overwhelming sentiment in favor of the sanitarium was expressed in the tremendous majority of 167,230 votes "for" the proposition, as compared with 39,410 "against."

On April 19, following the election, the mayor of Chicago appointed the first Board of Directors, consisting of Mr. Harlow N. Higinbotham, Dr. Theodore B. Sachs and Dr. Wm. A. Evans, former Commissioner of Health, ex-officio. The Board organized on April 22 with Mr. Higinbotham as president and Dr. Sachs as secretary and proceeded with the study of the situation and formulation of plans.

The funds for building the sanitarium were not available until January, 1911. The Board, however, anticipated the tax levy of 1911 by issuing tax warrants for $10,000 and using this amount for operation of seven dispensaries, which on September 1, 1910 were transferred by the Chicago Tuberculosis Institute to the Sanitarium, the transfer having been made possible by an interpretation of the Sanitarium Act by the Corporation Counsel, in which dispensaries as "stations or outposts of the sanitarium" were declared an integral part of the institution.

The work of directing and mapping out the plans of the sanitarium was assigned on March 1, 1911, to Dr. Theodore B. Sachs, the secretary of the board, who was made chairman of the committee on plans.

On May 22, 1911, Wm. A. Otis and Edwin H. Clark were appointed architects of the institution.

The work of preparation of the plans has continued, since then, in daily sessions of the chairman of the committee on plans and the architects, Mr. Frank E. Wing acting as secretary. Through the entire period of preparation of the plans and elaboration of its various details, frequent conferences were held with the former and present Board of Directors, which at this time consists of the following members appointed by Mayor Carter H. Harrison: Dr. Theodore B. Sachs, president; Dr. George B. Young, present Health Commissioner, secretary; and Mr. W. A. Wieboldt.

The final plans represent the result of several years of work during which many similar institutions all over the country were thoroughly studied.

The Chicago Municipal Tuberculosis Sanitarium, as constituted at present, is being operated under a more comprehensive law than the original Sanitarium Act of 1909. The extension of the scope of the sanitarium was made possible by an amendment passed by the Illinois Legislature June 27, 1913 (Senate Bill 515, introduced by Senator Glackin), which confers on municipalities the power "to establish and maintain a public sanitarium and branches, dispensaries and other auxiliary institutions . . . for

the treatment and care of persons afflicted with tuberculosis . . . to extend the benefits and privileges of such institution . . . into the homes of persons afflicted with tuberculosis and to furnish nurses, instruction, medicines, attendants, and all other aid necessary to effect a cure, and to do all things in and about the treatment and care of persons so afflicted which will have a tendency to effect a cure of the person or persons afflicted therewith and *to stamp out* tuberculosis in such city."

Thus the Chicago Municipal Tuberculosis Sanitarium, as constituted today, has more comprehensive power and scope of work than its name implies. It is a *municipal organization* of a sanitarium, dispensaries and other agencies necessary in fighting tuberculosis in the community.

Its component parts are:

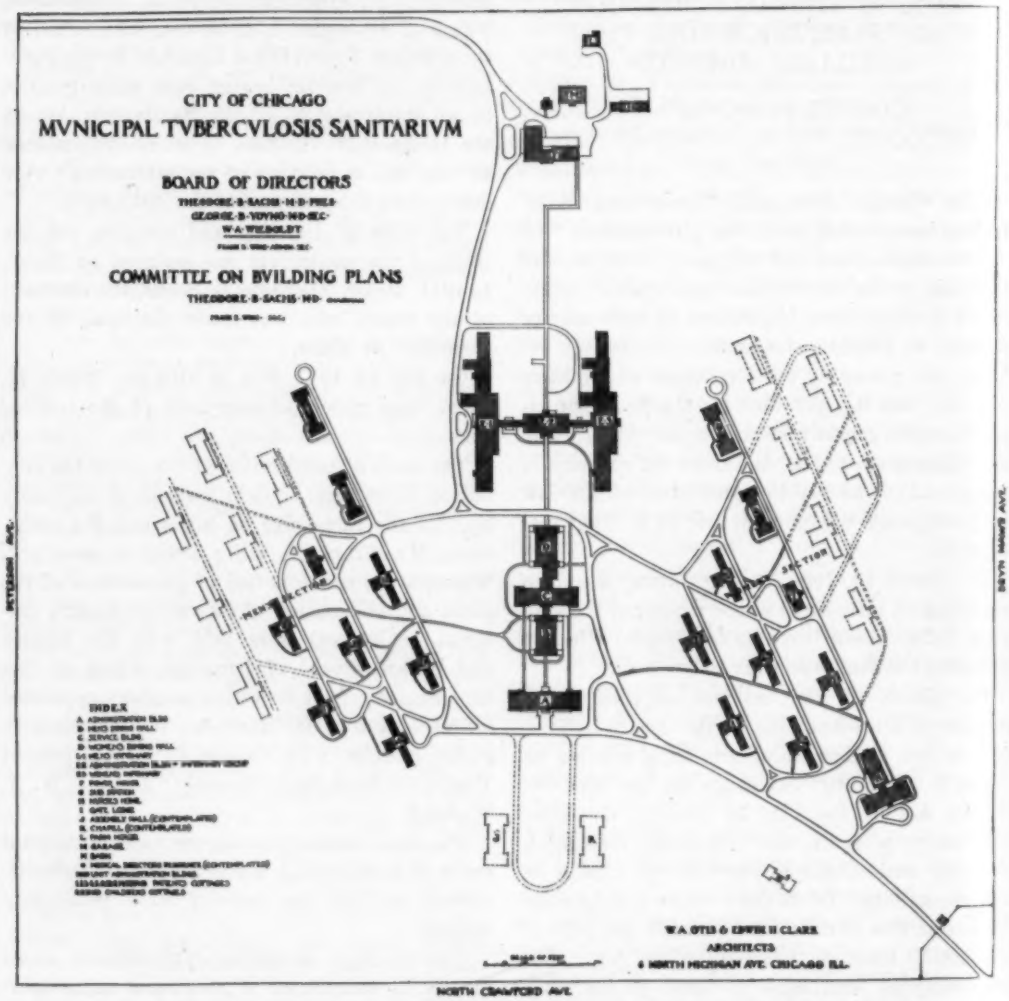

Fig. 1. Lay-Out of Buildings and Grounds, Chicago Municipal Tuberculosis Sanitarium.

1. *The Dispensary Department,* the function of which is detection of cases of tuberculosis, selection of suitable cases for treatment at the sanitarium and other institutions, and supervision of the large number of cases which have to be treated at home, either before admission to an institution or subsequent to discharge, also of

cases in which institutional treatment is impossible for various reasons.

The sanitarium maintains 10 dispensaries in various sections of the city, with a force of 35 paid physicians and 50 field nurses. The growth of the work of the dispensary department is shown by the following tabulation:

	1911	1912	1913	1914
Number of patients under observation	4,943	9,159	12,593	14,972
Number of positive cases.	1,911	2,196	2,727	3,538
Visits by patients to dispensaries	22,331	42,335	43,989	52,244
Visits by nurses to homes of tuberculous patients.	31,980	32,678	39,737	46,183

2. *The Sanitarium Home Extension Department.* On April 14, 1914, the sanitarium established a bureau of special relief, the function of which is to facilitate the extension of "the benefits and privileges" of the sanitarium "into the homes of persons afflicted with tuberculosis," a provision included in the Sanitarium Act by the amendment of 1913 (Senate Bill 515).

The bureau of special relief concerns itself with remodeling and building inexpensive sleeping porches and supplying the necessary equipment for outdoor sleeping, such as beds, bed clothing, reclining chairs, canvas curtains, etc.

This first municipal undertaking of its kind in this country, having for its object isolation of the tuberculous patient from his family and giving him a chance to carry out rational treatment at home, is being carefully and economically worked out.

The bureau is bound to become an important factor in the activities of the sanitarium.

3. *The Educational Department.*

Since the organization four years ago of the dispensary department of the Chicago Municipal Tuberculosis Sanitarium, the educational activities of the sanitarium have steadily grown, necessitating at present the concentration of all educational work under the head of a well equipped educational department. Important preliminary steps in this direction have been taken and the educational work in all its branches, is being standardized and adjusted.

The educational propaganda carried on at present consists of:

a. Distribution of small leaflets bearing on early diagnosis of tuberculosis and giving location and hours of the ten Municipal Tuberculosis Dispensaries. Similar leaflets in reference to other important phases of the problem, for circulation among patients and their families, are being prepared by the dispensary department.

Fig. 2. Type of Children's Cottage, Chicago Municipal Tuberculosis Sanitarium.

b. Publication of *Bulletins.* The first bulletin published by the dispensary department contained papers on various phases of the tuberculosis problem read by field nurses at the meetings of their Nurses' Tuberculosis Study Circle. The individual papers were: "Historical Notes on Tuberculosis," by Miss Rosalind Mackay, R. N., superintendent of field nurses; "Visiting Tuberculosis Nursing in Various Cities of the United States," by Miss Anna M. Drake, R. N.; "Provisions for Outdoor Sleeping," by Miss May MacConachie, R. N.; "Some Points in the Nursing Care of the Advanced Consumptive," by Miss Elsa Lund, R. N.; "Open Air Schools in This Country and Abroad," by Miss Frances M. Heinrich, R. N.

The second bulletin of the dispensary department is being prepared now. It will contain "Instructions to Field Nurses in the Dispensary Department," having reference to various phases of their work and methods of co-operation with other organizations.

c. Publication of *Bulletins of the Sanitarium Department.* A comprehensive "History and Description of the Sanitarium" is being prepared and will be issued in February. This will be followed by the publication of periodic bulletins bearing on the various phases of the sanitarium work.

d. Co-operation in maintaining the *Tuberculosis Exhibit* of the Chicago Tuberculosis Institute which in a period of 237 exhibit days was shown in field houses of various small parks and in some of the public schools, the exhibit being viewed by 246,904 people.

Fig. 3. Group of Infirmary Buildings, Chicago Municipal Tuberculosis Sanitarium.

The exhibit, with its daily conferences and its entertainments, planned to attract large audiences, will be continued for 2-week periods in various public schools of Chicago until the end of the present school year. In addition to this exhibit, special tuberculosis exhibits were prepared by the Municipal Tuberculosis Sanitarium for the Housing Exhibit (1912) and the Public Health Exhibit (1914), both held at the City Club.

4. *The Sanitarium.*

The Chicago Municipal Tuberculosis Sanitarium is to open for admission of patients on March 1. In October, 1914, Dr. J. W. Coon, formerly superintendent of the Wisconsin State Sanatorium, was appointed by the Board of Directors as superintendent of the sanitarium, and the staff of the institution is being rapidly organized.

The institution is situated on a 160-acre tract, in the northwest section of the city. When completed, the cost of land, improvements, buildings and equipment will amount to about $2,400,000.

The comprehensive provisions of the institution have been planned to meet, in an efficient way, the important phases of institutional solution of a tuberculosis problem in a large city. The plan is the result of years of study of the needs of the situation based on the experience of Chicago and other large cities. The present plant is the broad foundation on which Chicago is to begin the serious task of providing adequate and efficient institutional care for its large army of tuberculous men, women and children.

Some of the important and unique features of this Institution are:

1. *Location* of the institution *within the city limits,* giving the advantage of (a) greater facility of the control of the institution by the city, unhampered by ordinances and prejudices of other communities; (b) *accessibility* of the institution to relatives and friends of patients; (c) accessibility of the entire institution to the entire community, thus enhancing its *educational influence,* and (d) accessibility to the *general medical profession* in Chicago, creating a link between the family physician and the institution, and placing the medical staff of the sanitarium in close contact with the medical organization, institutions and their leaders in a large city.

With all these advantages the sanitarium is in a good location, free from all undesirable conditions.

2. *Provision for Various Stages of the Disease.* The administrative facilities of the sanitarium, as now completed, are for the care of 950 patients (650 ambulant cases in cottages and 300 bed cases in the infirmary). On the day of opening of the institution, in March, the number of avail-

able beds will be 650, to be increased one year later to 950 by the addition of twelve cottages.

The sanitarium is for the accommodation of the incipient as well as the more advanced cases in which "arrest" or marked improvement of the process is possible with the application of the sanatorium methods of treatment. At present Cook County (of which Chicago is a part) provides, in its tuberculosis institutions, about 900 beds for the far advanced cases. With the further development of the Chicago Sanitarium, it is planned to materially extend its facilities for advanced cases.

3. *Comprehensive Laboratory and Medical Facilities for the Study and Treatment of Cases.* Full recognition has been given to the importance of: *First,* the study of the individual cases, with the aid of all the medical and laboratory methods in use in modern general hospitals, and, *second,* the efficient treatment not only of the tuberculous disease but also of all the co-existing and complicating conditions. The comprehensive arrangement includes a main laboratory, x-ray department, examining rooms, nose and throat rooms, dental and minor surgery rooms—in the main administration building; routine examining and nose and throat rooms and routine laboratories—in each unit administration building (for the ambulant cases) and in the infirmary; and in addition to that, operating rooms, orthopedic department and a special x-ray department—in the infirmary.

4. *Comprehensive Provision for Children.* Of the ultimate capacity of 950 beds, 240 are for children, housed in groups of 25 to 30 in open air cottages of an original design, in which the open air school is a prominent feature.

5. *Maternity Department for Tuberculous Women.* This important provision, the first in this country, consists of a maternity department in the infirmary, with all the necessary auxiliary arrangements, and a series of adjoining private rooms, so located that their number can be easily extended to meet the demands of the situation.

6. *Nursery for Infants of Tuberculous Mothers.* The important provision of a nursery for infants of tuberculous mothers is one of the features of the institution. This is the first provision of its kind in the country. The department was planned for two classes of cases: (a) Newborn infants from the maternity department of the sanitarium, and (b) infants removed from such home surroundings in which prevention of infection is impossible. The full consent of the parents will be the prerequisite of admission to the nursery.

Fig. 4. Type of Adult Patients' Cottage. Chicago Municipal Tuberculosis Sanitarium.

This undertaking will undoubtedly prove of considerable value in meeting one of the serious problems of the tuberculosis situation, namely: the care of infants of tuberculous mothers and education of the community in the matter of proper care of all infants with poor resistance who are in contact with tuberculous infection.

7. *Provision for Employment of Ex-Patients.* It was planned to give employment to as great extent as possible to discharged patients in various departments of the institution. In furtherance of this policy, open air sleeping quarters have been provided in various employes' buildings, the open air arrangements representing more than one-third of the entire housing provision for employes.

In 1905 the entire provision for tuberculous

patients in the City of Chicago consisted of about 200 beds for advanced cases, of which number 150 beds were in the Poorhouse. The City was devoid of the least evidence of any organized effort against tuberculosis.

In 1915 Chicago will have in all over 2,300 sanatorium and hospital beds, a comprehensive, well organized dispensary system and all other auxiliary arrangements essential in the fight against the disease. This places Chicago in the forefront of American cities.

SUPPURATIVE GLANDULAR TUBERCULOSIS, SIMULATING TYPHOID TERMINATING IN MILIARY TUBERCULOSIS.*

H. J. Dooley, M. D.,
CHICAGO.

The following case of acute miliary tuberculosis, which had been treated as typhoid fever and later as epidemio meningitis, was very instructive and interesting to those who saw it and, thinking its unusual aspects might prove so to others, I decided to report it.

W. M.—American, single, age 20 years, by occupation a barber, presented himself to me, after becoming gradually ill during previous two weeks. Before this time, he stated, that he has entirely well. He then complained of feverishness, malaise, anorexia, pain across the front of the chest, slight pain in the right lower abdomen and slight headache, but had had no cough, no epistaxis and no diarrhea. As stated, his trouble began two weeks before, after a slight cold and although the patient insisted upon working even up to the first day I saw him, his employer advised him otherwise. There were no gastric, genito-urinary or nervous symptoms present.

Inquiring into his previous history, I found it practically negative, except that he had been exposed to an advanced case of pulmonary tuberculosis for several weeks, in the person of the porter at the barber shop. Except for the diseases of childhood he had no illnesses before. He was temperate in his habits as regards smoking and drinking. He denied venereal infection. He had lived in Chicago for several years before which time he resided in southern Missouri. Examination at this time showed a well developed and moderately well nourished young man, with flushed cheeks, who looked sick.

His temperature was 101.5 F. by mouth; pulse rate of 100, regular, and of good quality; respiration 22 per minute.

*Read before Douglas Park Branch Chicago Medical Society, Dec. 15, 1911.

Except for the coating of the tongue and flushing of the cheeks above noted the head and neck were negative.

Examination of the chest revealed the movements of the thorax, excursion of the lungs, to be normal and equal on the two sides. *There was some tenderness over the anterior chest, which seemed particularly marked over the sternum.* Findings of a general bronchitis over both lungs, but no localized areas of dulness or rales were elicited.

The heart was negative except for accentuation of pulmonic 2nd. There was no eruption on the abdomen or chest. No tympanites and no splenic enlargement palpable. There was some tenderness, but no rigidity in the right iliac region. Genito-urinary system was negative; extremities, except for brisk knee jerks, were negative, eye and ear, and nervous system were also negative.

Concluding at this time that he had some intestinal infection, either la grippe or typhoid fever, I advised him to enter St. Anthony's Hospital for further observation and treatment. The following day he walked to the hospital, a distance of several blocks, stating he felt well, but on being put to bed it was found he had a temperature of 105, pulse rate of 110 and respiration of 22, and that he was quite prostrated. I saw him the next day when he had more headache, more ilaic tenderness and gurgling, enlarged spleen and a few atypical rose spots on abdomen and chest. The leucocytes were 5,600, Widal and blood culture were negative.

In a few days his general appearance was quite typical of typhoid fever, with apathy, sordes on lips, tympanites, typhoid odor and typhoid stools.

He was placed on typhoid orders, after thorough cleansing of the intestinal tract with calomel and castor oil, so that at the end of the first week in the hospital, his temperature ascended to not more than 102° at night and his general condition seemed good.

The course continued uneventful for four weeks with mild continuous fever, relatively slow pulse, leuconpenia, but a persistently negative Widal reaction. In all six were performed, two by Dr. Sprafka, the interne on the service, two by the Health Department and two by myself. In the case of the latter, they were negative even in a dilution of 1 to 20 in one hour. Suspecting therefore, that it might be some infection other than typhoid we exhausted every means to find another focus of infection, but of no avail. Repeated examinations of sputum, urine and blood showed nothing and careful watching of endocardium, gall-bladder, lungs, joints and other possible localizations were negative. A moro tuberculin test was negative, but this was of no importance because of his fever. The latter was quite typical of typhoid fever and the pulse and temperature relations would certainly point to that infection.

Six weeks passed and the patient remained about the same, his fever averaging 101.5° at night. Although he was "feeling fine," to use his own words,

we now began to look for some complication to account for the persistency of the fever, concluding it was probably not typhoid, but paratyphoid with which we were dealing. On deep palpation in the right iliac region I was surprised to find a rounded, tender mass, too low, apparently for the kidney and nearer the location of the appendix. We suspected at first that this was a lymphatic abscess, but upon examination a few days later, when it was less tender and the tympanite was less marked, it was easily determined to be a low movable kidney. This was confirmed by Dr. S. E. Donlon, Dr. Tieken, and also by Dr. Ryan. Each of the above consultants could find no signs of a localized infection and believed the case to be one of typhoid fever running an unusually long course, in spite of the negative widals.

Consulting the literature on atypical typhoids, I noted a class of cases, called attention to by Osler, in which the persistency of the fever was a nervous phenomenon. He advised increasing the diet, allowing the patient to sit up and cease taking the pulse and temperature for a few days. Knowing it could do this patient no harm, I increased his diet, first to soft diet and later to a full diet and he seemed to improve under it. At this time his fever still ascended to 101° at night and after a few days he begged to get up. At the end of the eighth week, therefore, we permitted him to sit up beside the bed and finally to walk around a little.

While he always said he felt well, he seemed quite weak and his fever remained the same, his pulse now averaging 110. It was upon his urgent request to leave the hospital, stating that he was sure he would get along quicker and better, that I yielded and permitted him to go, advising him to come to the office in a day or two, as I intended to do a paratyphoid widal on him, but particularly to watch his pulse and temperature.

He seemed to be doing nicely for three or four days after leaving the hospital, although he did not present himself for examination. He left the hospital on a Monday and I was called to see him the following Friday at the house, where he was suffering with headache and general weakness. My suspicions of meningeal involvement were aroused on examination by the headache, mental dulness, slight fever, slight rigidity of the neck and a slight Kernig on one side. I ordered him sent to the hospital and this time, on account of lack of funds, he was taken to the Cook County Hospital. His course here was this: He entered ward 4 July 1, with the examining room diagnosis of relapsed typhoid. As may be seen from the history, no signs of meningitis were elicited by the interne at first examination. The following day, however, spinal fluid showed increased pressure, was serous, Nonne-Pelt test positive, cells were 160 per ccm., lymphocytes predominating. Leucocytes were 7,400, widal reaction negative, dilution 1 to 40 in one hour.

Patient became progressively worse, more stuporous with more rigidity of the neck, nystagmus and marked Kernig. July 4, spinal puncture showed clear fluid, not under pressure, predominance of polymorphonuclear leucocytes and a gram negative diplococcus, not intracellular. On account of the latter finding he was given 15 c.c. antimeningococcic serum, which we repeated the next day. He became rapidly worse, however, and died July 6, five days after entering the hospital and eleven weeks after the onset. Permission for a post-mortem examination was obtained and was performed the next day by Dr. Bissell, the pathologist of the Cook County Hospital. The following were the findings:

Marked caseous tuberculosis of the tracheo-bronchial lymph nodes.

Marked hyperplastic fibro-caseous tubercular biliary lymph nodes.

Tuberculous ulcer of ileum.

Tabes mesenterica.

Marked nodular fibro-caseous tubercular spleen.

Marked bilateral tubercular broncho-pneumonia.

Marked tubercular basilar meningitis.

Miliary tubercules of choroid plexuses of both lateral ventricles.

Muco-purulent tracheo-bronchitis.

Marked bilateral hypostatic congestion and moderate edema of lungs.

Cloudy swelling of kidney, liver and myocardium.

Moderate acute emaciation.

Multiple hypodermic puncture wounds of both arms.

Fibrinous persisplenitis.

Focal peritonitis (fibrinous) over the parietal peritoneum covering the right kidney.

Retrocecal-appendix.

Redundant colon.

Jackson's membrane.

Abnormally low position of right kidney.

Fibrous adhesions between lower border of liver and the hepatic flexure of the colon.

Moderate focal nodular sclerosis of the lining of the aorta and of the aortic and mitral valves of the heart.

Unequal dilatation of the pupils.

You can readily see from what I have read what a strong alibi we have for our first mis-

taken diagnosis. At the onset this patient had practically every symptom of typhoid fever, except the positive Widal, bacillemia and typical rose spots, yet he did not have typhoid or paratyphoid. Later, on account of the insidious onset of the meningeal symptoms, we concluded the involvement was tuberculous, and began to suspect that the intestinal condition might also have been phthisical, though we were at a loss to point out the primary focus, which only the post-mortem demonstrated.

Taking into consideration the termination and post-mortem findings, we theorized as follows, to explain the symptoms and course:

The patient probably first developed a bronchial gland involvement, which produced the primary symptoms of a moderately severe infection, such as fever, malaise, anorexia and especially the pains over the anterior chest. At this time he probably had some ulceration in the ileum also, because of the local symptoms there, and it was this latter lesion, which became rapidly worse and secondarily infected, just previous to his entering St. Anthony's Hospital, that we believed produced the symptoms, which so closely resembled typhoid fever. This localization, of course, produced the tabes mesentericae and biliary lymphadenitis. His subsequent course at the hospital was due to these abdominal foci and the bronchial gland lesion, although there were at this time no symptoms localizing either. In all probability it was the latter lesion, that is, the tracheo-bronchial adenitis, which ulcerated into a tributary of the pulmonary vein, which brought about the acute generalized tuberculosis of which the tuberculous meningitis was a part.

Being able to follow the conduct of the case, from the very onset through the post-mortem it impressed me strongly as illustrating the well-known similarity between typhoid fever and miliary tuberculosis. Osler says, in respect to them, "At the onset, tuberculosis may readily be mistaken for typhoid—rarely the reverse—and the subsequent course, if it lasts weeks, will usually clinch or rule out the possibility of typhoid fever." This case, I believe, was a good example of this principle.

4000 W. Harrison Street.

SPINAL ANESTHESIA IN GYNECOLOGY.*

H. J. Boldt,
NEW YORK, N. Y.

I have been honored with a request to speak to you on local and spinal anesthesia, and scopolamine and morphin narcosis; and to give a practical demonstration of operating upon patients under the influence of such non-inhalation narcosis. While I assure you that I appreciate deeply this honor, I am nevertheless certain that you could, probably, in your own midst, have found a better exponent of the method.

It is not my intention to inflict upon you a long address. It is my purpose, rather, to limit myself to a few practical remarks from my personal point of view, and to make these briefly; chiefly because I am selfish enough to wish to learn from other speakers.

The subject of local anesthesia for gynecological operations, I feel constrained to omit, in that I do not consider my experience yet large enough to speak authoritatively on that phase of the subject. For general surgical operations, however, I can assure you that, so far as I have been able to observe, there are few operations that need be excluded. Particularly at the Imperial Surgical Klinik of Bier, at Berlin, was this made clear to me. Extensive thyroidectomies, resections of large joints, etc., are done daily at that clinic, under novocain anesthesia. Baum has rendered to the medical profession and to suffering humanity an invaluable service by his practical work and writings in this field of endeavor.

Medullary or spinal anesthesia has many adherents, but it has still more opponents; and the reason therefor I shall make obvious. Cocain was the first drug used for this purpose. I employed it for a short time in cases where I considered inhalation anesthesia hazardous, but because of the frequently reported fatalities, I discontinued it. Stovain and tropocain I never made use of; for while these drugs are less dangerous than cocain, yet fatal results often followed their employment. In the thousands of cases of patients upon whom novocain was used, however, I failed

*Read before the Clinical Congress for the Study of Local, Spinal and Scopolamine-Morphin Anesthesia, Chicago, Ill., Jan. 26, 1915, under the auspices of the Chicago Medical Society.

to find a single recorded fatality attributable directly or indirectly to the drug. For this reason, I again began the use of spinal anesthesia.

Failures to Bring About Anesthesia—The worst that I can say for medullary anesthesia is that it may occasionally fail, so that inhalation anesthesia must be resorted to. Nevertheless, in my own practice, I have had but one complete failure and but few partial failures, making in these latter a small quantity of ether necessary. Concerning the complete failure, I may add that in the preliminary narcosis, though a total of half a grain of morphin and 1/60 grain of scopolamin had been injected, they failed utterly in bringing about a physiological effect. There was no fault in the technic of the spinal puncture; the spinal fluid came out in a strong jet, and 2 c.c. of a 10 per cent solution of novocain were injected.

Undesirable Effects—These are limited, so far as my observations go, to occasional more or less severe headaches, which sometimes continue for several days. They are usually relieved, however, by the administration of the combined bromides; a total dose of 2 gms. of the combination of potassium, sodium, and ammonium bromide being given in a glass of water at intervals of four hours, until three doses have been given. In some instances, pyramidon has given prompt relief. When the headache is very severe and very obstinate, despite the remedies used, the puncturing of the spinal canal and letting off about two c.c. of fluid is said to bring about prompt relief. But I have had no patient in whom it was necessary to resort to repuncture. My patients with headaches have decreased to an almost negligible number, since my practice is to allow about as much fluid to flow off as injected. Another untoward symptom occasionally met with is nausea during operation. Sometimes this is associated with vomiting, which makes it very disagreeable, particularly in abdominal operations, but on the whole, the undesirable symptoms occur so seldom that I cannot regard them as a deterrent objection to spinal anesthesia.

The occasional paralysis of one or both extremities, a few instances of which have been reported, I believe to be due entirely to faulty technic. I have seen none. Where such paralysis has occurred it was only temporary.

The last objection that may be raised against spinal anesthesia, and in my opinion the most valid, is that the patient is conscious of what is going on and can hear everything that is said. This, then, brings us to the question of preliminary narcosis, which I consider as important as the spinal injection.

Preliminary Narcosis—I should not care to subject any patient to spinal anesthesia without preliminary narcosis. The narcosis should be deep enough to give us reason to believe that the patient will be oblivious to surroundings. The preliminary narcotic—hydrochloride of scopolamin (Merck) and morphin—should be prepared freshly, and I prefer to give it in divided doses, because owing to occasional susceptibility to the drug, a third dose may prove unnecessary and be omitted. The powders, hydrochlorid of scopolamin 1/60 grain, and morphin 3/8 of a grain (until a few weeks ago, only 1/4 grain of morphin was included), are put into separate powders. Just before the first dose is to be given they are dissolved in two c.c. of boiling water. One-third of the mixture is injected 2½ hours before operation, and one-third at the end of an hour. When an hour later, the third dose is due, it can be ascertained whether the patient is sufficiently under the effect of the narcotic to make a good subject for spinal anesthesia. That is, whether so lost to surroundings as to be heedless of what is going on, and likely to sleep throughout the operation or the greater part of it. I have no set dosage—it depends entirely upon the circumstances. In very heavy patients I do not hesitate to give 1/6 grain morphin for each of the first two doses, and 1/4 grain morphin for the last dose, in conjunction with scopolamin, if the patient at the time that the third dose is due is still wide awake. I take the view that it is cruel to subject the patient to spinal anesthesia without preliminary narcosis; and I believe that this may be one of the objections which very many entertain against medullary narcosis. The same holds good for local anesthesia. The preliminary narcosis that I have mentioned in the foregoing in connection with spinal anesthesia should be employed.

Indications for Spinal Anesthesia—If one should ask me: "Is spinal anesthesia indicated as frequently as I make use of it?" I would unhesitatingly answer, "No." Indeed, as a matter

of fact, it is indicated in comparatively few cases. For those patients in whom inhalation anesthesia is contra-indicated because of some organic defect of their system, or because of exceptional obesity—and we know that exceptionally obese patients do not bear an anesthetic as well as the ordinary class of patients, particularly if they have been accustomed to the use of alcohol—we can conscientiously say that either spinal or local anesthesia is *the* method of anesthesia. How comparatively seldom such cases occur, we all know. We also know that ether, in conjunction with nitrous oxide and oxygen, is a comparatively safe anesthetic. I believe it to be about as safe as novocain. Therefore, it stands to reason that if we also consider the objectionable features to novocain anesthesia, there is a good reason for so many to decline to make use of it, in spite of its being far more economical than any other form of inhalation anesthesia.

Still, there is another condition that I may cite in favor of novocain anesthesia in conjunction with the preliminary narcosis: in case of necessity we can dispense with one assistant; which is of paramount importance, particularly in country practice, or in some instances of emergency.

Some may object to spinal anesthesia because of supposed risk incurred when the spinal puncture is made, but I can give positive assurance that there is no reason for apprehension if proper technic is used and thorough aseptic precautions taken. Of course, we know that no matter how trifling an intervention may be, there is risk if not properly made. All things considered, however, and basing the conclusion on my personal experience, I unhesitatingly say that I would sooner give up the use of the scalpel in doing surgery than give up spinal anl local anesthesia in connection with preliminary narcosis by morphin and hydrochlorid of scopolamin.

I have found that from 1½ to 2 c.c. of a 10 per cent solution of novocain is the most reliable strength; although a five per cent solution is sufficiently strong for most cases. Further, that it is better to prepare the solution freshly rather than use ampule solutions.

In operations of long duration, 2 c.c. are used. In those of short duration 1.5 c.c. are sufficient.

SPINAL AND LOCAL ANESTHESIA COMBINED.*

L. H. DEBAYLE, M. D.
LYON, NICARAGUA.

Professor of Clinical Surgery of the Medical School of Nicaragua; Correspondent Member of the Academie de Médecine de Paris; Formerly Dean of the Medical School of Nicaragua.

Résumé.

I adopt this term to describe a method that I have employed for many years with the best results and without any immediate or late accidents.

The spinal anesthesia, especially that secured by tropacocain and adrenalin solution, is in many cases complemented by a local one obtained by either novocain and adrenalin, or quinin and urea.

Owing to the well known dangers of general anesthesia during and after operations I have always tried to find a safer method. Following the work of my teacher Reclus, I began in 1887-1889 as an interne in the Hospitale Tenon and Hotel Dieu, Paris, associated with Dr. Dufournier, to employ local anesthesia by cocain solution. Afterwards, I used the spinal puncture and the spinal injection of cocain (Nicaragua, 1897-1899), which I substituted later by stovain (1899-1900), and by stovain and strychnin (Jonesco's method, 1909), which I never used in the upper parts of the spine.

After many trials, gathering by personal observation the several methods employed in France, Germany, Austria and England, I have adopted the method that forms the subject of this paper—using as a general rule tropacocain in salt solution with adrenalin (see formula 1). I have also used novocain (see formula 2) and in some cases stovain. I often complement the spinal injection with local anesthesia by novocain (see formula 5), or by quinin and urea hydrochloride (½ to 1 per cent), because it has been always my aim to use the spinal injection as low as possible according to the operative needs of each particular case. For instance, I have preferred, in performing a suprapubic cystotomy, to make the spinal injection in the 4th or 3rd lumbar in the space which will generally produce complete anesthesia of the bladder and other intrapelvic viscera, and, if required, to anesthetize the abdominal wall from the umbilicus to the

*Read before the Chicago Medical Society, Jan. 26, 1915.

pubis by local injection of a few c.c. of either of the two above specified solutions.

Following the same aim—to use only the needed amount of anesthetic—after five or ten minutes, according to the analgesic effects observed in the patient, I withdraw once or twice the amount of liquid injected, by which means I remove from the spinal canal, after acting on the cord from 25 to 35 per cent of the anesthetic.

Aside from these two factors—the site of injection, the lowest possible, and the amount of the drug employed, the smallest for the purpose, —there is another element of importance the role of which is most essential for the success of the anesthesia in the region where it is needed and the prevention of accidents due to the diffusion of the drug toward the upper part of the spine. This element is the specific gravity of the solution injected in relation to that of the spinal fluid. To the careful consideration of these three factors I am indebted, I believe, for the unmarred record of over 500 cases comprising a wide variety of intrepelvis, lower abdominal and perineal operations.

FORMULAS.

I—Tropacocain .....0.05 grams
(a) Sterile salt sol. (5%)..... 1 cc.
Sterile sol. of synthetic suprarenin (1/1000) ..... 5 drops
For one injection.

or, Tropacocain .....0.10 grams
(b) Sterile salt sol. (5%)..... 1 cc.
Sterile sol. of synthetic suprarenin (1/1000) ..... 8 drops
Inject 1 cc. or the whole amount.

I use solution (a) containing only 0.05 grams of tropacocain for short operations and sol. (b) more concentrated, introducing from 0.07 to 0.10 grams of tropacocain when I need intense and prolonged anesthesia. I have obtained anesthesia lasting two hours and a quarter by the use of this sol.

II—Novocain ..... 0.15 grams
Normal salt sol..... 3 cc.
Synthetic suprarenin .....0.00025 grams
Inject 1½ cc.

III—Stovain ..... .0.10 grams
Sodium chloride .....0.10 grams
Adrenalin .....0.125 milligrams
Sterile water ..... 1 cc.
Inject ¾ of 1 cc.

IV—(Dr. Babcock's light sol.)
Stovain .....0.08 grams
Lactic acid .....0.02 cc.
Absolute alcohol .....0.2 cc.
Distilled water (q.s. ad)..... 2 cc.

V—(Local Anesthesia).
Novocain ..... 1. gram
Adrenalin ..... 0.0025 grams
Normal salt sol.....100. cc.
From 3 to 50 cc. can be used.

Note.—When I need a light solution in order to use the Trendelenburg position I use the following modification of formula—I (a):

Tropacocain .....0.12 grams
Synthetic suprarenin .....0.25 milligrams
Alcohol (absolute) .....0.2 cc.
Water (distilled) .....1.8 cc.
Inject from 1 to 1½ cc.

Solutions 1, 2, 3, are of greater specific gravity than the spinal fluid; the 4 and the last, both alcoholic solutions, are lighter. They flow and diffuse according to their specific gravity, hence, we must consider the position of the patient and the curves of the normal canal (dorsal, lumbar), to circumscribe the area of anesthesic action and to avoid accidents.

Method of Injection—In all cases of intrapelvic and lower abdominal, perineal and the lower extremities, I proceed as follows: Cleanse the back with ether and alcohol, paint with iodine solution (5 per cent) drawing a line between the crests of the iliac bones which marks the 4th lumbar interspace. Five minutes later wash away the iodine with alcohol in order to prevent its introduction into the spinal canal because it has been proven that the least irritation of the spinal membranes is apt to produce slight meningitis according to Sicard's experiments in animals.

(*a*) Patient sits on the edge of the table, with the legs hanging, fore-arms crossed and facing straight forward. The spinal column must not be bent too much nor too straight. Let the patient slightly flex and extend the spine anteroposteriorly and laterally in order to facilitate the finding of the space selected. This will be found counting from the interspace already marked or by counting from the 11th dorsal process frequently more prominent.

(*b*) Introduce a needle 7.5 cm. long and 1 mm. in diameter, at right angle, sometimes a little upwards, in the middle line of the spine; after the skin and ligaments have been pierced you can feel the slight resistance as the dura is overcome. The fluid will run out; if not so and you are sufficiently deep turn the needle gently between the fingers and run a wire through it to prevent obstruction of its lumen.

(*c*) Let 4 or 5 c.c. of spinal fluid run out if you find marked pressure or if you need more intense analgesia, and introduce the solution which

must be ready in a genuine Leur's glass syringe which is kept in place so as to verify, by pulling and pushing the piston, that you have free communication with the spinal cavity.

(*d*) Test the patient's legs. He will feel them heavy and will begin to lose the motor power and will be gradually anesthetized in from 5 to 10 minutes. When anesthesia is obtained draw out from the spinal canal once or twice the quantity of solution injected and let the patient lie down on the operating table.

(*e*) If you need anesthesia in the lower abdomen and perineum you will keep the patient in a horizontal position with the head and neck slightly raised because of the specific gravity of the tropacocain solution. If anesthesia is needed in the upper part of the abdomen raise slightly the hips watching closely the appearance of analgesia, the respiration and pulse. In many instances, however, I have been able to place the patient, after injection of tropacocain solution by the technique above described, in a moderate Trendelenburg position for suprapubic cystotomy and abdominal hysterectomy without any accident. I believe this is due to the withdrawal of the surplus anesthetic from the spinal canal and the consequent weakening of the anesthetic wave in the slow diffusion of the injection in the spinal fluid.

Point of Injection—The anesthesia is more effective if the roots of the nerves that supply the field of operation are directly in contact with the anesthetic solution before it is diluted in the spinal fluid. Thus, taking into consideration the specific gravity of the solution that may flow in one or other direction, according to the position of the body, and having in mind the anatomical origin of the various spinal nerves, the injection must be introduced in the corresponding interspace and the patient kept in this or that position. For perineal operations the 4th or 3rd lumbar interspace will be selected. For operations on the leg, the 2nd lumbar. For the lower abdomen the 1st lumbar is more suitable; but I have observed that by complementing the spinal with the local anesthesia (10 or 15 c.c. in the abdominal wall), I can obtain a complete anesthesia with the spinal injection in the 3rd interspace for bladder operation, herniorraphy, ovariotomy and even abdominal hysterectomy for non-adherent fibroids. Local injections are also used around the cervix in vaginal hysterectomies.

For operations in the stomach, gall-bladder, liver, the injection must be given at the 12th dorsal interspace, placing the patient immediately in the horizontal position, leaving the injection in the canal or withdrawing it after 5 or 7 minutes. In the latter cases the table is provided with supports to raise the patient in the horizontal position and leave a space that will permit the needle to remain in place while the patient is on his back. In cases of upper abdominal surgery I have found Dr. Babcock's method with the light solution very convenient. He has been kind enough to allow me to observe the wonderful results obtained by him in his large practice at the Samaritan Hospital in Philadelphia.

It is very important to remember that most of the accidents that occur (frequently to those not acquainted with the method) are due to the passage of the anesthetic into the upper region of the cord in the respiratory and other superior centers. Hence, keep the patient during and after the operation in the proper position, raising the hips slightly in case of a light alcoholic solution and the contrary in case of a heavier injection (see formulas).

Apparatus—A glass Luer's syringe with a rather loose piston; capacity of 2 cc. and a needle 7.5 mm. long and 1 mm. in diameter provided with a small stylet. It is preferable to use a platinum needle and a small extra needle to be able to fill the syringe from the ampoule containing the liquid to be injected while the spinal needle is in place.

Indications—All operations of the lower abdomen and of the genito-urinary tract. In operations of the upper abdomen in cases where the general anesthetics are contraindicated.

In old patients and those who have kidney, heart and pulmonary troubles. I have found the tropacocain injection in the 2nd, 3rd and 4th lumbar interspaces always harmless.

Contraindications—In very young children, in extreme old age, in all suppurative processes, in recent syphilis, acute infections and febrile tuberculosis; in which cases it may produce a *locus minoris resistenciae* and start a localization in the meninges. In very advanced arteriosclerosis, locomotor ataxia and other diseases of the spinal cord. When the spinal fluid is found turbid no injection should be made.

Accidents and Complications—I have never had a death. I have never observed paralysis or

sphincter troubles. I have only had, once, when patient was placed in marked Trendelenburg position after a heavy injection, some respiratory trouble, rapidity of the pulse and lowering of the blood pressure, all relieved after hypodermic administration of caffein, strychnin and adrenalin. I have observed headache and vomiting in a few cases and in two cases of nervous women marked and prolonged suboccipital pain for six or seven days. I have also observed in other clinics, in Europe and in America, some cases of more serious accidents, fever, paralysis of the sphincters and one case of death. But these patients were not injected with tropacocain and as far as I could understand the rules about position were not carefully observed. Besides, there have been reported to me by friends several accidents from the use of upper spinal injections and some meningeal symptoms after injections more or less irritating or, perhaps, where asepsis was not strictly preserved. It seems to me, after many years of personal practice and observation in other colleagues' clinics, that in patients carefully selected the complications can be avoided if we remember the following points: 1. Avoid irritant drugs, concentrated solutions and observe the most strict asepsis. 2. Make the spinal injection as low as possible according to the case and complement by local anesthesia, keeping the patient in a properly inclined operating table and bed during and after the operation, according to the solution employed. 3. Never choose an interspace above the 11th dorsal and if you need to inject it here proceed with care, trying to push the needle only deep enough to pierce the dura. The end of the cord is found in the adult at the superior border of the 1st lumbar and a little lower in the female. 4. Use the heavier solution with the patient in the sitting position and with a light solution make the patient lie down immediately after the injection.

Strychnin, caffein and adrenalin solutions may be used to relieve the respiratory and circulatory troubles. Acetphenetidin and sodium bromide for occipital pain. Narcotic injections of scopolamin and morphine are used once in a while in very excitable patients before the spinal injection.

As it is impossible to report the numerous cases I have observed, I will briefly enumerate the following: Several supra-pubic sections for tumors and stones; vaginal hysterectomy; ovariotomy; abdominal hysterectomy; nephrotomy. In several cases I have been able to repeat in the same patient spinal injections and I found the spinal fluid completely normal and no motor or sensory disturbance. Three times in a man for cystotomy for stones and tumor. Three times in a woman who had sporotrichosic sinuses in the perineal and gluteal region and five times in two years in a young woman who had gangrene of the vagina and bladder after dystocia badly managed. These operations were performed to repair a vagina and bladder almost completely destroyed.

3327 WALNUT STREET,
PHILADELPHIA.

SACRAL ANESTHESIA.*

KURT E. SCHLOESSINGK, M. D.,
FREIBURG, GERMANY.

It is not my intention to give you in this paper a review of the entire literature written about lumbar and sacral anesthesia. I think I am following the ideas of those who were kind enough to invite me in confining myself to the theory and technique of this anesthesia as practiced at the Freiburg clinic.

Before going, however, into the technique of the sacral anesthesia I believe we should contemplate for a moment the theory of spinal anesthesia in its general aspects. As regards the lumbar anesthesia, it is strange that the surgeons and the gynecologists should be divided in their opinions, the majority of the surgeons being against it whereas it is gaining more and more friends among the gynecologists. But we had to go through very bad experiences before we developed the technique we are using now.

Up to the year 1912 the Freiburg clinic had a record of over 2,542 cases of spinal anesthesia without a single death or a single paralysis of the rectus externus, and with but two cases of paralysis of respiration requiring artificial respiration. We do not believe that the choice of the anesthetic itself is of greatest importance, stovain, tropacocaine, novocain or alypin being equally effective. The most important thing for the success of the anesthesia and for its performance without danger is, to our mind, the solvent, the specific gravity of the solution, the

*Read before the Chicago Medical Society, Jan. 26, 1915.

freezing point of the solution, the temperature of the solution at the moment of injection and the position of the patient during and immediately after the injection.

Heinicke and Läwen have shown us that the toxic effect on the whole organism after resorption from the spinal canal is of lesser consequence. The actual danger lies in the effect at the immediate place of application. If a sufficient quantity of the anesthetic should rise up to the medulla oblongata or to the phrenicus center a consequence of such local effect would be the deadly paralysis of respiration. If we succeed in keeping the anesthetic injected into the lumbar sac away from the medulla oblongata, vital center as it is, we may be sure to avoid accidents. That is the reason why it is so very important to have the patient in the right position during the injection, to be careful that the injection be not made too quickly and to take into account whether the solution used has a specific gravity lighter or heavier than the spinal fluid. All of this is true for both lumbar and sacral anesthesia. The reasons why, in a great number of cases, we give preference to sacral anesthesia over lumbar anesthesia are the bad after effects of the latter, particularly the very bad headache of the patient, which in most cases we fail to alleviate.

The Frenchman Cathlin was the first to make injections into the extradural space for therapeutic purposes in human beings. Stoeckel was the first to introduce it into Germany in obstetrics and tried to bring about painless delivery by sidetracking the sensitiveness of the sacral plexus by means of novocain and eucain injections. Essential progress in sacral anesthesia was made through the experimental pharmocological researches of Läwen and Gross. They proved that novocain as a base is preferably used in an alkaline solution of so low a degree that precipitation of the particles which are insoluble in water is avoided. Such a solution has a much stronger and more lasting effect than the saline solution of hydrochloric acid which always acts as an acid reagent. By injecting novocain in a sodium bicarbonate solution into the extradural space, Läwen succeeded in getting a sufficient anesthesia of the region of the plexus sacralis and the lower part of the plexus lumbaris to enable him to operate on the perineum and vagina. Schlimpert of the Freiburg Frauenklink continued these experiments which had been started by Läwen, using at first his technique, but developing later his own technique in applying it in obstetrics and gynecology.

Sacral anesthesia in gynecology was used at first in performing "low" operations, viz., operations in the regions where the nerves are fed from the lower part of the plexus lumbalis. Later Schlimpert extended the indications for sacral anesthesia to all abdominal operations by using the so-called high extradural anesthesia. Before giving you the details of our technique, permit me to review the anatomy of the extradural space. In the region of the spinal canal the extradural space is bordered on one side by the lumbar sac, on the other side by the periosteum of the vertebral canal; below, the extradural space is closed by a solid, water-tight membrane extending between the cornua sacralia at the end of the os sacrum; above, the cavum extraduralae is closed in such a way that at the foramen occipitale the dura fuses into the periosteum of the skull.

The extradural cavity is filled with fat in an almost fluid state and penetrated by nerve trunks which are sheathed in the dural membranes and which leave the spinal canal by the foramina intervertebralia.

In the extradural cavity there is also a large net of intercommunicating veins surrounding the nerve sheath. The blood from these veins pours into the vena azygos and hemiaxygos and then reaches the vena cava superior.

The extradural cavity does not provide a naturally defined space, but Cathlin has shown us that by shifting the almost fluid fat we are able to inject up to 250 c.c. of fluid. The easiest entrance to the extradural space is obtained through the membranes extending between the cornua sacralia and closing the hiatus sacralis below.

We learn from the anatomical conditions that in the practical application of the sacral anesthesia the solution injected into the extradural space can never reach the brain.

The veins which we find in the extradural space might, of course, be easily punctured by the needle, thus producing the possibility that the entire anesthetic solution is directly injected into one of the open veins. The danger of puncturing the hiatus sacralis is especially great while the woman is in a sitting posture. In that case the veins in the sacral part are tightly filled. Therefore the danger of injuring a vein is lessened if

the puncturing of the sacral canal is performed while the patient is in the Trendelenburg position; in this case the veins are in a collapsed condition and are therefore less exposed to the point of the needle.

We distinguish between two technical methods of producing sacral anesthesia, according to the effect we wish to obtain:

1. The low extradural anesthesia.
2. The high extradural anesthesia.

By low anesthesia we understand an anesthesia which shall only anesthetize those regions which are provided for by the plexus sacralis and the lower parts of the plexus lumbalis. In operative gynecology it means, therefore, the vaginal and rectal operations. The high extradural anesthesia, on the other hand, covers all operations in the abdomen up to kidney and stomach work.

TECHNIQUE.

Preliminary Narcosis—In order to mitigate the pains attendant on the sacral injection and also in order to take from the patient the unpleasant impressions created by the puncture and by the position itself, we put the patient before every operation into the "Daemmerschlaf." Furthermore, we have been able to prove, as a matter of experience, that the depth of the anesthesia and especially the relaxation is dependent on the depth of the "Daemmerschlaf." We give to our patients three hours before the operation 0.0003 scopalamine and 0.03 narcophine; or 0.02 pantopan; three-quarters of an hour after the first injection we repeat the dose. All patients receive one gram of veronal on the evening before and half a gram of veronal on the day of the operation. We reduce this dose to only half a gram of veronal on the evening before the operation in all cases where patients are strongly cachectic. If these injections are not sufficient to produce a deep "Daemmerschlaf" we give another injection of 0.003 scopolamine and 0.0015 narcophine.

Two hours before the operation we give the patient an enema into the rectum, consisting of a tumblerful of Burgundy mixed with water and sugar. The reason for this is that during the narcosis, in a number of cases, the face of the patient turns very pale. Whether that is an effect of the novocain or the arenaline we do not know. However, the vasdilaporic effect of the Burgundy wine does noticeably diminsh the frequency of this paleness, which is a secondary effect of the extradural anesthesia.

The Injection—Our injections are carried out in two different ways:

1. For the low anesthesia with the patient lying horizontally on her side.

2. For the high anesthesia in the knee-elbow position with the patient horizontal or with elevated pelvis.

We select the hiatus canalis, sacralis, i. e., the lower opening of the sacral canal, for the point of entrance, palpating through the skin by the two cornua sacralia. We palpate the processus spinosi of the sacrum down to its lowest part till we feel where they divide in a fork-like manner, and thus come to a triangular space bounded on the sides by the two cornua sacralia and offering the elastic resistance of a deep-lying membrane. The hiatus is easily found when puncturing in the knee-elbow position, as it lies in the continuation of the anal groove. It is best found by injecting one finger's breadth away from and above the anal groove. The entrance is best obtained at an angle of about 45 degrees to the body surface.

For puncture needle we use a kind of a trocar. To facilitate a proper position of the patient we use a specially constructed chair in which we can place our patient comfortably, but which enables us to swing her around into the knee-elbow position.

When we feel that the needle has passed the membrane we retract the sharp needle and advance the dull, hollow tube alone into the canal; then we lower the pelvis of the woman and see if any blood is flowing from the needle, in which case we stop the procedure because there is danger that the entire novocain solution might be injected into a vein. If there is no flow of blood we inject with a 20 c.c. record syringe about 10 c.c. of a physiologic saline solution to make sure that the needle has reached the extradural space. If it has not we see a subcutaneous swelling appear and feel a greater resistance while injecting. The needle should not be introduced deeper than four centimeters into the hiatus sacralis, the lumbar sac commencing six to eight centimeters from the closing membrane, which involves the danger of eventually perforating it.

The Solutions—We most frequently use the following formula:

℞ Natr. Bicarb.....0.25

Natr. Chlor	0.5
Novocain hydrochloricum	1.0
Aq. Dist	100.00

A short time before using the solution we heat it until it reaches for a moment the boiling point and then cool it down to 39 degrees centrigrade. By using a solution of this temperature its anesthetizing effect is noticeably raised and local irritations, such as we find when injecting cold solutions, do not occur. Now we add one-quarter c.c. of superanenin and one-half a gram of sodium sulphite. The superanenin is injected to produce a contraction of the blood-vessels which, in the first place, prevents a too rapid absorption of the novocain by the blood and the subsequent acute intoxication, and which, furthermore, is considered to guarantee a slower resorption, thereby producing a more continuous action.

The sodium sulphite is added to prevent oxidation, which otherwise would easily occur.

While making the injection the pelvis of the patient is somewhat elevated. Furthermore, we must take care not to inject the whole solution at once because we must always bear in mind the possibility that the point of the needle may enter a vein with the result that the whole amount of the fluid would at once get into the circulation. If the entire dose of novocain of 0.5 to 0.6 would get into the circulation of the blood at once, paralysis of the respiration would be the result. To prevent such an accident we inject first only 20 c.c. of the whole amount and then wait about half a minute. If in that time we do not see a change in respiration we can be sure that is extradural and not intravenous, because we know from experiments on animals that the effect of novocain poisoning is lightning-like. The rest of the entire amount is injected gradually within approximately one and a half to two minutes; and this injection is not one continuous, slow injection but a series of jerky spurts. This is necessary because otherwise the injected fluid would diffuse through the foramina intervertebralia into the adjacent tissues without taking effect on the nerve trunks.

For the low anesthesia we always use, as I mentioned before, a side position, injecting the solution as described above in the course of from one to two minutes. Immediately after the injection we place the patient on her back with only a slight elevation of the pelvis. The anesthesia generally sets in at the perineum after two or three minutes.

For the high anesthesia we use the knee-elbow position, as mentioned before. We puncture and inject with highly elevated pelvis. The patient is left in this position for about five minutes after the injection. Anesthesia sets in in from five to ten minutes.

Dosage—In low anesthesia the normal dose is 0.6 gram = 60 c.c. of a 1 per cent solution. In patients weighing less than 105 pounds and in cachectic patients we use 0.5 gram = 50 c.c. of 1 per cent solution. In cases of haemorrhoids 0.4 gram = 40 c.c. of 1 per cent solution.

In high anesthesia the minimum dose is 0.5 gram, the maximum dose, 0.8. Most often we used a 1.5 per cent solution, which made it possible for us to give smaller amounts of fluid. The normal dose is 0.7 gram. For myomectomy, gallbladder and kidney operations we used 0.8 gram.

Duration—On an average the low anesthesia lasts from three-quarters to one hour, or from one hour to one and a quarter. The high anesthesia lasts, on an average, three-quarters of an hour. If the anesthesia does not last long enough we resort to chloroform or ether, of which only very small quantities are necessary.

Quite often an extreme pallor appears a quarter or half an hour after the injection. Undoubtedly this pallor is due to a fall of the blood pressure as a consequence of the novocain action. If the right dosage has been chosen there is no danger. The pallor lasts from two to three hours, and it must be admitted that on the face of it the condition may look somewhat threatening.

Contra-Indications—On account of the fall in blood pressure one should make it a rule not to use sacral anesthesia on patients who are suffering from serious heart trouble or have a defective vascular system. The high extradural anesthesia should not be used in cases of very large abdominal tumors or in cases of pregnacy because the long continuation of the knee-elbow position with elevated pelvis might move the heart mechanically and thus produce disturbance of the heart action. The sacral anesthesia should not be used on very obese women because it is very difficult to find entrance for the injection. Also, in women over sixty, we would prefer to use the lumbar anesthesia, the after effects of which, in such cases, being very insignificant.

After-Effects—The most pleasing feature of the sacral anesthesia is that there are almost no after-effects. Post-operative vomiting almost never occurs, and that is very important in operations of the stomach and the intestines. Headaches, which we find so frequently and so persistently in the lumbar anesthesia, do not occur after the sacral anesthesia.

CONCLUSIONS.

As Schlimbert says, "The sacral anesthesia is the anesthesia de luxe." But the technique is by no means simple and it demands a number of trained assistants. The advantages are the absence of vomiting before and during the operation and, in the successful cases, the perfectly beautiful state of anesthesia with its complete relaxation. The drawbacks, beside the difficulty of the technique and of the dosage, are the fall of blood pressure and the limited duration of the anesthesia.

OPERATIONS FOR LACERATION OF THE CERVIX UTERI.

HENRY F. LEWIS, A. B., M. D.
Professor of Obstetrics and Gynecology in Loyola University. Obstetrician to Cook County Hospital.
CHICAGO.

Fresh lacerations rarely call for any treatment, operative or otherwise, except measures to avoid septic infection. Nearly every full term labor and many premature deliveries cause more or less tear of the cervix. This is so common that one can usually make a diagnosis of a previous pregnancy by the examination of the healed cervix. The transverse slit which distinguishes the multiparous os from the round os of the nullipara is the result of the trauma incidental to labor.

Practically the only indication for repair of the fresh laceration is hemorrhage. When the tear extends far enough to sever a large branch of the uterine artery there may be severe bleeding. The blood continues even when the uterus is firmly contracted. Tampon of the upper vagina rarely suffices. One should force the uterus down by the hand externally and by volsellae on the cervix until a good view is obtained. Then one should pass sutures to unite the rent, beginning at the depth of the angle and continuing down to the end of the torn portion.

Immediate repair of lacerations of the cervix as a routine measure is now advocated by few good authorities. So far as I know Hirst is the only writer of prominence who recommends it. In a well-equipped hospital or in the private practice of specialists, he advises examination of the cervix post-partum and repair of lacerations. His own practice is to wait until the fifth or seventh day of the puerperium; then to expose the cervix by means of flat specula and by pulling it down with volsellae; then to sew up the rents. Sometimes he considers it necessary to freshen the edges of the wounds before applying the sutures.

Let us consider objections to the practice of immediate examination and repair of the cervix. First and foremost comes the increased danger of infection. In the present day, he is a bold man who, without indisputable indications, advocates anything which demands exploration, exposure and increased traumatism of structures in the upper part of the vagina during the early puerperium. Obstetricians know full well how great are the chances of carrying infection from the never sterile vulva farther upwards into the genital tract. The longer we can keep infection away from the vagina, the cervix and the uterine cavity the better is the prognosis.

It is true that Bumm has proved that the genital tract is infected as far upwards as the internal os by the middle of the first week post-partum. By that time, however, the raw surfaces and the open lymph channels are sealed over and the wounds incidental to the trauma of the labor are well started towards healing. Surely this is an unfavorable time for adding more trauma and for opening up the channels for infection in the manner advocated by Hirst. He operates then in no sterile field, indeed, in no field which can by any possibility be made sterile, but in the presence of infection the virulence of which he has then no means of knowing. If one must operate on the cervix during the early puerperium he would best do so immediately after labor ends.

Another objection to immediate repair is because the tissues of the cervix are edematous and swollen just after labor and stitches placed there will soon become too loose to hold anything. To forestall this objection Hirst waits until the end of the first week. He escapes this unimportant Scylla to run into the arms of the terrible Charybdis of infection.

Another objection to immediate repair is its uselessness in the vast majority of cases. Why should one do an operation when nature offers great promise of doing it for him?

Herein lies the point of difference between lacerations of the cervix and of the perineum. The tendency of tears of perineum and pelvic floor is to gape because the muscles pull the edges apart. The tendency of tears of the portio vaginalis is to fall together. This is due to two factors.

In the first place, retraction of the uterus, including the untorn portion of the cervix, partly closes the cervical canal, thus bringing together the edges of the lacerations. In the second place the tubular vagina encircles the torn cervix like a splint, holding its torn edges in apposition. In other words, in the cervix the wounded tissues remain in apposition unless disturbed, while in the perineum they gape. We must remember, also, that the perineal wound becomes infected in a few hours, while the undisturbed cervical wound remains sterile for some days.

Nearly all lacerations of the cervix heal spontaneously. Many of those which heal by granulation leave a widely gaping opening with anterior and posterior lips. In most cases, however, the tissues have healed over so that no raw or granulating surfaces remain. The only abnormality is the cleft in the wall of the portio vaginalis on one side or on both sides. These conditions seldom call for any treatment because they seldom are the real causes of symptoms.

Emmett's theory that a vast number and variety of so-called reflex symptoms have their origin in irritation due to pressure by cicatricial tissue upon sympathetic nerve filaments within the scars at the upper angle of the tears is now held by few. In the epoch of gynecology in which Emmett did his great work it was generally believed that all sorts of nervous phenomena now known to be hysterical or neurasthenic were directly due to reflex irritation in some part of the genital system, usually in the uterus. Neurotic disturbances were observed, the cause was looked for in the genitals and was generally discovered.

Thereupon TREATMENTS, in capital letters, were instituted. Scores of varieties of displacements were noted, and were corrected by various pessaries or by ingenious operations. These displacements served as the excuse for treatment in virgins and nulliparae. In women who had born a child lacerations of the cervix were, of course, often discovered and these served as the excuse for treatment for such women. Gynecologists of surgical bent followed Emmett and operated for these conditions. Others gave "office treatments" for indefinite periods.

It is not for us to say that these measures did no good to the patients. The psychic effects of the operations and of the treatments probably helped some. Doubtless correction of bad mental and physical habits, attention to the bowels and to digestion did more. Also in not a few cases there was actual pathology; sub-involution, hypertrophy of the cervix and endometritis due to chronic infection; prolapse with retroversion due to impairment of the integrity of the pelvic floor; retroversion with adhesions due to former or existing chronic pelvic peritonitis.

Those cases of laceration of the cervix which require operation are now considered by the best authorities to be of three kinds. First are those cases where, although there are no raw surfaces or infection, an extensive bilateral laceration seems to be the cause of sterility or of repeated abortions. Second are those cases where granulations still exist in the torn tissues, where erosions are present, or where a chronic endocervicitis seems to be perpetuated by the eversion and exposure of the cervical mucous membrane. Third are those cases where there is hypertrophy of the cervix due to chronic infection and chronic passive congestion.

Abortion or sterility may be a result of laceration of the cervix. Sometimes the scar about the upper cervix may so hinder the enlargement of the corpus as pregnancy advances that contractions are set up and abortion results. Probably more often the accompanying endometritis interferes with the nutrition of the early ovum and so leads to its premature expulsion.

Sterility may be caused by the fact that the spermatozoa do not find the normal straight passage into the cavity of the body of the uterus and so do not reach the ovum to impregnate it. It is more likely, however, that the accompanying endometritis, with the consequent abnormal discharges, destroys the spermatozoa, prevents them from reaching the ovum or prevents the impregnated ovum from imbedding itself in the decidua.

Where granulations, erosions or chronic en-

docervicitis are kept up by reason of the existence of the lacerations operative treatment is indicated. Gaping of the torn cervix exposes the mucous membrane of the cervical canal to traumatism in coitus and otherwise, to maceration by the secretions retained in the vagina and to infection.

Hypertrophy of the cervix is by far the most common reason for operation in the treatment of lacerations. Two factors contribute to bring about this hypertrophy. First is the constricting action of the cicatricial tissue at the apex of the cleft. This tissue contracts like other scar tissue and constricts the upper portion of the cervix, causing passive congestion of the distal portion. This passive congestion causes enlargement of the portio vaginalis, catarrhal disease of the endometrium of the cervix, extravasation of leucocytes into the interstitial spaces of the cervix, and general hypertrophy of its structures. The cervical glands undergo hyperplasia, often become occluded in portions and give rise to the formation of the retention cysts so often observed in such cases, the ovula Nabothi.

Chronic infection of the tissues of the congested cervix is usually present and aids in the production of the hypertrophy. As swelling increases the enlargement follows lines of least resistance. Therefore, since the proximal end of the cervix is prevented from enlarging because of constriction of the scar tissue, the distal end enlarges in mushroom shape. The hyperplastic mucous membrane becomes everted. With this eversion of the endometrium and with the abundance of the ovula Nabothi, something of a cauliflower appearance results which resembles carcinoma. The surfaces are easily injured, often bleed and continuously give rise to a mucopurulent discharge.

The role of lacerations of the cervix in the causation of cancer is somewhat doubtful. In the majority of cases of carcinoma of the cervix there is a history of former laceration. Therefore many argue that there is a close causal relation between the two; that the laceration predisposes to cancer. On the other hand, carcinoma of the cervix occurs, in the vast majority of instances, in women between the ages of thirty-five and fifty. Most women between those ages are multiparae. Most multiparae have lacerated cervices. Whether the chief factor is age or the laceration remains a matter for dispute.

Long continued irritation seems to play an important part in the etiology of cancer in any part of the body. Notable examples are the lip and tongue in pipe smokers, the stomach, the rectum, the breast in women who have suckled children—all localities liable to frequent and prolonged irritation and slight trauma. That the lacerated cervix, especially when there is marked hypertrophy and chronic infection of the portio vaginalis, has been subjected to prolonged irritation and slight trauma goes without saying. Therefore, to a reasonable extent, the danger of supervention of carcinoma may be considered an indication for operation in cases of laceration of the cervix.

The two main types of operation are trachelorrhaphy and amputation of the cervix. Since we have departed from Emmett's ideas on the pathology, Emmett's operation of trachelorrhaphy is less often performed. Since we are recognizing more fully the part played by foci of chronic infection in the production of various ailments we have come more to advocate removal of such foci of infection. Therefore we now amputate the chronically infected, hypertrophic lacerated cervix and find less indication for the plastic operation of repairing the cervix.

Trachelorrhaphy is adapted for those cases of laceration where there is considerable bilateral cleavage without signs of infectious infiltration of the cervical tissues. Its indications are: Repeated abortions or long continued sterility where other causes for these conditions cannot be demonstrated; presence of granulation tissue or erosions which may be the sources of infection; chronic hyperplastic endocervicitis without much eversion of the mucous membrane.

Amputation of the portio vaginalis is indicated in nearly all cases where any operation is indicated. Its indications are: Hypertrophy of the cervix with rolling out of the inside of the cervical lips; marked eversion of the mucous membrane; cystic infiltration of the cervical tissues with retention cysts of the cervical glands; infection (cervical metritis) of the tissues.

The pieces removed in either of these operations should be carefully examined for traces of carcinoma.

If one can obtain catgut which will remain holding for ten days in the cervical tissues, such is the best material for sutures. Otherwise one should employ silk-worm gut sutures and leave the ends long so that he can easily remove them.

Summary: Fresh lacerations of the cervix rarely require treatment except aseptic prophylaxis. Immediate repair is only indicated when the tear has extended far enough up the portio to sever a branch of the uterine artery large enough to cause dangerous hemorrhage. Otherwise the danger of infection is too great to justify the rather remote advantages.

Laceration of the cervix *per se* is no indication for the secondary operation. Most multiparae have more or less cervical lacerations without symptoms which can rationally be attributed to that condition.

The complications of the laceration are the only proper reasons for operating. These are: Sterility or repeated early abortions; presence of granulations, erosions or eversion of the mucous membrane of the cervical canal, especially hypertrophy of the anterior and posterior lips of the torn cervix with signs of chronic infection or passive congestion.

The etiological role of lacerations as predisposing factors in cancer is doubtful but probable enough to have some weight in the decision to operate.

The two main types of operation are trachelorrhaphy and amputation. The former is adapted for those cases where there is little or no hypertrophy or infection, the latter for cases where hypertrophy and infection of the lips of the torn cervix exists, that is, in the majority of cases where any operation is indicated.

THE MILITARY SURGEON ON THE FIRING LINE.*

P. J. H. Farrell, M. D., M. R. C.
United States Army.
CHICAGO, ILL.

"The medical personnel of organizations must remain with them when advancing into action and during the whole course of an engagement. Accordingly the wounded will be treated where their wounds are received and the sanitary personnel will pause, if the organization is moving, only so long as is necessary to give appropriate first aid. At a later stage of the combat, when the movement of the organization permits and when justified by the number of wounded, a regiment aid station is established and operated."—*Field Service Regulations, United States Army.*

The above paragraph very clearly outlines the duty of the surgeon when the command comes under fire. First, let it be clearly understood that the surgeon is a military officer and his first thought and best efforts must be to do every thing within his power to help win the battle that is being fought. All effort to relieve suffering humanity is of secondary importance to the one main object, victory. Having this in mind, the surgeon will attend the wounded with all the skill that he possesses and in such a way that he will be of the greatest value to his commanding officer in helping to win the battle that is in progress.

The rapid disposal of the wounded by sending them to the rear when possible, so that the command will not be impeded in its movements, is second in importance to attending the wounded on the battlefield. A large number of wounded men are apt to have a discouraging effect upon their comrades. It is all-important that as many of the wounded as possible be returned to duty, for this is frequently an essential factor in winning a battle.

Every commander is dependent on full companies to win battles. The most important duty of an army officer, line and staff, is to help win the battle that is being fought; no sacrifice is too great to achieve victory.

A high degree of discipline is essential to success in this, the most important duty that the medical officer is assigned to in time of war. Discipline, organization and efficiency are inseparable in military duty.

The special military-medical functions are dependent on good organization; they consist in the rapid application of first aid and return to the fighting of the greatest number of the wounded.

No ambulances can be used upon the firing line, in fact, rarely can litter-bearers be used. The wounded man is treated where he falls. The soldier in all modern armies has a first aid package attached to his uniform.

We must not forget that the well being of the

*Read at the meeting of the Chicago Medical Society, October 21, 1914.

wounded is the end to which medical tactics are the means, and it is essential to keep constantly in mind the vital importance of sound judgment and thoroughness in the initial surgical treatment of the wounded; a secure, protective dressing and immobilization of fractures whenever possible.

Great care is always taken to remove or cut as little of the clothing as possible to avoid exposing the wound to infection, frost bite, sunburn or insects.

The medical profession of our country are not familiar with the change that has taken place in the duties of the medical officer since our civil war. Modern firearms have extended the fire zone from a few hundred yards to a distance of 8 to 10 miles. Infantry fire in the Civil War was not effective at more than 200 yards; now it is effective at 3,500 yards, revolutionizing the work of the surgeon in an engagement. It is impossible to transport wounded men beyond the range of fire. You will use whatever cover and protection is offered in the trenches or any natural cover that the field offers. The ability to command is very important; hospital corps men, like other soldiers, must have implicit confidence in their officers to do their best work. The surgeon must expose himself to the enemy's fire if it is necessary to relieve the wounded. His greatest value to the army is the rapidity with which he can get wounded men back in action, helping to the full extent to win the battle.

I would like to say a few words regarding war. War is of value for the great leveling influence that it has upon man. The peasant and the prince will learn the best of each other and appreciate knowing each other when they have been comrades in war. The bond of friendship and confidence in another man is deeper and more sincere between soldiers who have been to war and have faced the enemy's fire than any friendship, fraternity or brotherhood that has ever existed. It brings about a friendship that is valued almost as much as life itself. Therefore, in my opinion, war is of some value. It breaks down classes, destroys the bigotry of creeds. There are no creeds on the firing line.

Why do men go to war? Because war today, as it has been from the earliest history of the world, is the greatest emotion that the human being can feel. No other emotion stirs the souls of men as does the thought of war. And so long as this overwhelming emotion is felt by human beings, just so long will men continue to go to war.

The plea that has gone forth for many years throughout the world that a great military force, a powerful army and navy, was the best guarantee for peace, the present conflict in Europe shows is a fallacy. It has proven beyond the possibility of contradiction that the greater preparation for war in time of peace, the greater will be the slaughter when the war that is inevitable does come.

How will we prevent war in the future? Certainly not by great armies, great navies or compulsory military training. Education, and, if you please, religious training, is apparently the only remedy that will guarantee us peace.

Let me draw your attention to the emotion produced by the present war in Europe upon our own American women. Many thousands of our women are so stricken with this war emotion that they are working, working, making bandages, clothing, nightingales, pajamas, bloomers, etc. My experience in war is that 95 per cent of all this work and material is entirely wasted. An absurd and useless waste of time and money. Soldiers and soldiers' families, I am proud to say, refuse the world over, to be paupers and charity spongers. If you wish to help the civilians impoverished by war give money to the Red Cross Society and it will be wisely and economically used.

The results of war are many. Plague, poverty, distress and every possible form of human suffering upon one hand. Upon the other hand there are some benefits. Look at the result of the present war. A unified England with all her subjects loyal unto death. France with her royalists and republicans united. Russia with her anarchists and law breakers of a few months ago clamoring to fight for the Czar. Germany with her socialists and anti-royalists fighting shoulder-to-shoulder with the royal family. These are a few of the results that war brings about that we can well ponder over.

We have all read of the rulers of these great nations fervently calling upon Almighty God to help them destroy and slaughter the enemy. King, Emperor, Czar, have all implored super-

human aid to help in the slaughter. Apparently all of their prayers have been heard.

Again in war, death is not feared. The war emotion, or fever as it is called, is so great that men die willingly when at war. We all know that to die for one's country is to die a glorious death.

No major surgery can be attempted on the firing line. It is impossible. Dismiss any thought of doing surgery on the firing line. It is a senseless civilian dream. No probing, drainage or packing. Soldiers are young healthy men. Experience has taught us that conservative rather than radical surgery, gives the best results. You must wait until the army advances, retreats, or there is a lull in the fighting.

The greatest number of men are wounded and require first aid from infantry fire and the least number from the bayonet. The proportion killed in bayonet contact is larger than from either artillery or infantry fire. A soldier will fight with the bayonet as long as he can stand upon his feet or use his hands.

Humanitarians will tell you the chief functions of the Medical Service in war consists in attending the wounded on the battlefield, and the sick in hospital. Sanitarians will consider that prevention of disease in the field is the chief function. Both are absolutely essential; but the commander who is dependent on big battalions to win battles will expect, besides these mainly medical functions, the discharge of two others, the removal of the seriously wounded and immediate return to duty of as many men as possible.

Duty upon the firing line requires the medical officer to be active and alert, quick of perception, to stand fatigue and exposure, and who can do a maximum amount of work with the least possible assistance.

An army requires renewal of about 80 per cent of its strength in the course of a year's campaigning.

The seriously wounded cannot help win the battle that is in progress, and every effort and sacrifice must be made to achieve victory. We all remember what General Sherman said about war. The seriously wounded cannot receive attention while the fight continues. I want to emphasize this point, and also the important fact that no civilian surgeons are permitted to come within the fire zone. There is much information that I could give you upon the valuable aid that the civil organizations render, but it is not and never will be upon the field of battle. Trained military men of the medical and hospital corps only are needed upon the firing line.

The medical corps in time of war wear the usual brassard upon the left arm. The newspapers in reporting the present war in Europe make the mistake of referring to the medical officers as "Red Cross Surgeons." They are not "Red Cross" surgeons, for the latter are never in this day and age permitted to come within the fire zone. This rule is general with all armies.

The casualty list of medical officers in modern warfare is very heavy and equal to that of officers of the line and higher than that of any other staff corps. The medical officer is exposed to the enemy's fire in the performance of his duty; in fact, all officers are. An officer cannot retain command of his men and intelligently direct their efforts, neither can he retain their respect and confidence, if he is stretched out upon the ground. There is nothing heroic or inspiring in an officer who is hugging mother earth; he must remain in an upright position, notwithstanding the many criticisms to the contrary, one eminent authority even saying: "It was grand, but not war." I am convinced that it is necessary and the plain duty of every officer. This opinion is the result of my personal experience upon a number of battlefields and duty with troops under fire upon four continents. As I look back from the safety and comfort of civil life I can see no reason to change my opinion. Better a thousand times to die a soldier's death than to live with a suspicion of cowardice hanging over you.

In our civil war 13 per cent of the wounded died. In the Franco-Prussian war 11 per cent. In our army in the Philippines 8.1 per cent died. In the Russian-Japanese war the rate was 6.8 per cent for the Japanese and 3.2 per cent for the Russians.

I hope we will soon begin to receive statistics for the present war in Europe.

It will be interesting to note if the improvement in the death rate of the wounded has continued; for the above statistics show consistent progress in military surgery during the past fifty years.

32 N. State Street.

PRELIMINARY REPORT OF RESEARCH DEMONSTRATING THE INFECTIOUS NATURE OF CANCER.*

HENRY W. ABELMANN, M. D.,
CHICAGO.

The animals and specimens I have to present at this time show some of the results of constant study and experimentation during the last six years. This is to be a preliminary report, for the reason that certain results of my investigations are still pending. However, my work has now developed to the point where I can demonstrate a number of diseased conditions in animals which have resulted from inoculation with cultures obtained from human cancer material.

In March, 1909, a male patient, about 40 years of age, with a diagnosis of operable brain tumor, came under the care of Dr. E. H. Ochsner, whose assistant I was at that time. After careful examination of this patient, I made the diagnosis of endothelioma (carcinoma-Ribbert) of the pleura with a metastatic growth in the brain. My diagnosis was later confirmed by the microscopic findings.

During my studies in Vienna I had the opportunity to observe a similar case. Recognizing the systoms in Dr. E. H. Ochsner's patient, I made my diagnosis accordingly. I shall briefly state the case which came under my observation in Vienna, because it is of extreme interest in connection with my experimental work. A male patient, 40 years of age, was admitted to the "Allgemeine Krankenhaus" in Vienna complaining of cough, dyspnea, and a general weakness which had been coming on gradually for a period of several months. A clear straw color fluid was aspirated from the left pleural cavity. The patient's condition improved and he was sent home, his case having been diagnosed as tuberculosis of the pleura. He returned to the hospital a year later, on the day I arrived in Vienna. During the year's time a small, hard nodule about the size of a bean had developed at the site of the puncture made for the aspiration. This nodule was removed and examined microscopically and proved to be an endothelioma. I had occasion to observe this man for a period of six months until he died. A post-mortem was held. His pleura was extensively involved in cancerous growth and no evidence of tuberculosis was found in any of his organs.

Having taken a special course in Vienna on the study of tumors, I was taught that "carcinoma" and "sarcoma" are two separate and distinct diseases. This teaching, however, did not agree with my clinical observations. My experience with cancer had forced me to look upon "carcinoma" and "sarcoma" as different manifestations of the *same* disease and also prompted me to regard cancer as truly an infectious disease as tuberculosis and syphilis. So I decided when I returned home to do research work along these lines, the findings of which I am now able to present. The animals mentioned in the cases below are the ones brought to the Chicago Pathological Society two years ago, at which time I stated that they were suffering from cancer and would succumb to the disease. Owing to the fact that the cultures were obtained from different sources, I found it necessary to classify the results of my research into five series.

The cultures used in the first series were obtained from the above mentioned case of Dr. E. H. Ochsner. I inoculated three guinea pigs with the following results:

Series 1. Cases *a* and *b*. Two of the guinea pigs remained well while the third (case *c*) extremely emaciated, died after a period of seven months. Upon post-mortem examination extensive lesions were found in the liver, spleen, retroperitoneal, mediastinal, axillary and inguinal lymph glands. The picture under the microscope resembled a tubercular condition.

Series 2. On November 7, 1909, three chickens were inoculated with cultures obtained from a metastatic growth in a lymph gland of a patient suffering from carcinoma of the stomach.

Case *a*. The first chicken was inoculated in the peritoneal cavity and died November 7, 1910, exactly one year after inoculation. The first signs of the disease were noticed towards the end of the seventh month. The chicken appeared anemic and lost in weight. In the last two months the chicken's condition grew worse, noticable by ruffled feathers and a drooping of the tail. Upon post-mortem examination, the chicken was found to be emaciated and the abdomen was much distended. In the peritoneal cavity 8 ounces of free, clear fluid was found which coagulated soon after being removed from the cavity,

*Read before the Chicago Medical Society, June 3, 1914.

while the peritoneum itself varied somewhat in thickness in different places. The other organs, while appearing anemic, were apparently free from pathological changes.

Fig. 1. Series 2. Case B.

a. The primary cancer.
b. Cancer a deux.
c. Secondary growth in gizzard.
1. Enlarged lymph node at cloaca.
2. Enlarged lymph node in thigh.
3. Enlarged lymph node in neck.

Case *b*. The second chicken inoculated in the pleural cavity showed difficulty in laying eggs at the end of the eighth month. The laying of an egg was always followed by a temporary paralysis of the right leg. At the beginning of the tenth month the chicken appeared anemic, lost in weight, was slow in its movements, the feathers were ruffled, the tail dropped and it ceased to partake of food. That the chicken was suffering was evident from the pinching of its eyelids. The foregoing observation prompted me in killing the chicken on December 9, 1910, one year and one month after date of inoculation. (See Fig. 1.) Autopsy revealed a primary malignant tumor 1.5x1x1 c. m., located near the liver area and springing from the chest wall behind the parietal peritoneum. This tumor caused a deep depression in the liver and in this depression, on the surface of the liver, several small isolated contact cancers (cancer *a deux*) were found. An irregular shaped metastatic tumor 2.5x1.5x0.75 c. m. was found in the subperitoneal fat covering the gizzard. The lymph glands in the thigh were as large as coffee beans. A few enlarged lymph glands about the size of a grain of wheat were also found in the neck. Another metastatic tumor 1.75 c. m. in diameter was found on the right side of the cloaca. This tumor undoubtedly was responsible for the difficulty in the laying of eggs and for the temporary lameness of the right leg, which followed the laying of an egg. The histological appearance of these tumors showed them to be "lympho-sarcoma." (See Fig. 3, Series 2, Case B.)

Case *c*. The third chicken received the injection in the lung. The first sign of disease appeared after a period of about nine months, when its comb began to look pale. At about the tenth month dyspnea appeared, which became quite no-

Fig. 2. Series 2. Case C.

a. Miliary carcinosis of the liver.
B. Showing where section of cancerous lung was removed.
c. Metastatic cancer of the skin.

ticeable upon the slightest exertion. The chicken gradually grew weaker, lost in weight and finally died two years and two months after date of inoculation. Upon post-mortem examination

both lungs were found to be a solid mass of tumor. (See Fig. 2.) This explains the shortness of breath from which the chicken had been suffering. A retroperitoneal lymph gland 1.25 c. m. in diameter was found on the left side of the chest. The liver was full of secondary tumors, varying in size from a pinhead to a pea. In the skin overlying the breastbone a metastatic tumor 2.5x1.75x1.25 c. m. had developed. The microscope showed these tumors to be spindle-cell sarcoma. (See Fig. 3, Series 2, Case C.) One interesting feature of the microscopical picture of a section of the lung was the growing and projection of cancer tissue into a blood vessel, demonstrating absolutely the malignant character of the tumor. (See Fig. 3, Series 2, Case C.)

Series 3. While the animals in the foregoing series were inoculated with culture obtained from human cancer, the three cases in this series will show the results of inoculation with culture obtained from a "lympho-sarcoma" in a chicken of Series 2.

Case *a*. The first animal received inoculation in the peritoneal cavity and died after a period of five months. The post-mortem examination showed practically the same results as found in Case *a*, in Series 1.

Case *b*. The second chicken died eighteen months after receiving the inoculation in the peritoneal cavity. Autopsy revealed very different conditions than were noticed in the foregoing cases. After the expiration of seven months the chicken's comb began to look pale. The eyelids were of a light yellow color and appeared more or less puffy. The last few weeks before its death a weakness was evident, noticeable by its staggering gait and inability to stand for any length of time. The animal would shake its head as though suffering from dizziness. Upon post-mortem examination the chicken was not found to be emaciated, but a thick layer of panniculus adiposus and a fair amount of dark yellow fat in the abdominal tissues was found. Microscopical examination of the internal organs revealed nothing abnormal except their anemic appearance. Food was found in both crop and stomach.

Case *c*. The third chicken is still living, but sickly in appearance. Tumors are developing between its toes.

Series 4. This series of animals, consisting of three rabbits and four chickens, were inoculated March 9, 1911, with cultures obtained from a patient of Dr. A. J. Ochsner, who suffered from sarcoma of the testicle.

Fig. 3. Series 2. Case C. Miliary focus of metastatic cancer in the liver.

Series 2. Case C. Cancer growing into the lumen of a blood vessel.

Series 2. Case B. Subperitonal fat almost completely replaced by cancer tissue.

Case *a* and *b*. The first and second rabbits died of anemia November 1 and 2, 1911, respectively. Post-mortem examination revealed nothing abnormal except the anemic condition of the internal organs.

Case *c*. The third rabbit died November 19, 1911. A hard tumor 3x2x2 c. m. was found in the gastro-hepatic omentum. A second tumor 2x1.5x1 c. m. had developed in the lung. The microscopic picture is not that of a malignant tumor, but of a chronic inflammatory condition resembling tuberculosis.

Case *d*. The first chicken died November 7, 1911, anemic and emaciated. The internal or-

gans were normal except for their anemic appearance.

Case *e*. The second chicken of this series died three years after inoculation on March 6, 1914. The animal seemed perfectly healthy until about two months before its death, when anemia developed, noticeable by the pale and sickly appearance of the comb. About one week before its death its desire to eat seemed to have vanished. Autopsy revealed an enlargement of the abdomen due to about 6 ounces of clear, straw-color fluid which was found free in the peritoneal cavity. A retroperitoneal tumor about the size of a small hen egg was located in the posterior wall of the abdomen near the cloaca. The microcospic examination showed this tumor to be a "lymphosarcoma."

Case *f*. The third chicken died March 26, 1914. The symptoms were about the same as noticed in the last mentioned case. Upon post-mortem examination, however, only three drachms of clear fluid was found in the abdominal cavity. The gall bladder was enlarged to about twice its normal size and filled with a clear straw-colored mucus. The fundus of the gall bladder was thickened and hard. In the liver was a metastatic tumor about 1.5 c. m. in diameter. In the right inguinal region six to eight nodules about the size of millet seed had developed. A section of the gall bladder examined under the microscope showed *carcinoma*, although inoculated, as you will recall, with cultures from *sarcoma*.

Case *g*. The fourth chicken is still living and of a sickly appearance.

Series 5. On September 10, 1911, two chickens were inoculated with cultures obtained from cancer of the skin (epithelioma) removed from the thigh of a patient of Dr. M. Schulze.

Case *a*. The first animal died the second day after injection, apparently from injury received from the needle.

Case *b*. The second chicken died July 27, 1913. It was apparently well until about two months before its death; anemia and a profound weakness were the most striking symptoms. The feathers having been removed, the abdomen was found to be very much enlarged, due to a uniform enlargement of the liver to about three to four times its normal size. The spleen also had increased in size. The animal was not especially under weight. The microscopic diagnosis of the condition was "leukaemia."

These are all the cases I have to offer at this time. Summing up the results of my experimentation carried to this point, I find that:

1. That there is a difference between cancer cell transplantation and cancer infection. (*a*) With the transplantation of a malignant tumor the cells simply continue their growth as a piece of the original tumor. With cancer infection, however, the specific micro-organism is responsible for the development of cancer and here the infected animal's own tissue cell undergoes a malignant change. *b*. In inoculating with the cancer germ any type of this disease is liable to develop. (See Case F, Series 4.)

Whereas with a transplanted cancer the same type of tumor will develop as has been transplanted. *(c)* In infected animals there is no telling where a tumor will develop. With transplanted cancer, however, a tumor will grow at the site where the grafting was performed. *(d)* With cancer infection, animals will take the disease irrespective of species, whereas with cancer cell transplantation animals of the same or closely allied species have shown results. *(e)* With cancer infection usually metastatic tumors develop, whereas with cell transplantation secondary growths very rarely occur. *(f)* Time is a great and important factor with infection, as manifestations of the disease appear months and even years after inoculation (henceforth the impossibility of diagnosing cancer in its early stage in human beings). Whereas with transplanted cancer a tumor usually starts to grow as soon as it is grafted.

2. Certain infected animals never developed cancerous tumors (carcinoma and sarcoma), but developed conditions that strongly suggest the probable similarity or possible identity of conditions found in human beings, namely, pernicious anemia and leukemia, others die from a condition simulating tuberculosis.*

I am indebted to my father, Mr. H. A. Abelmann, and to Mr. G. Hake for assistance in this work.

6152 Kenmore Avenue.

*See "Heredity in Cancer," ILLINOIS MEDICAL JOURNAL, April, 1911.

ON THE DIAGNOSTIC WORTH OF LABORATORY DATA IN GASTRIC CANCER.*

(An Analysis of the Finding of 700 Cases, Operative and Pathologically Demonstrated.)

FRANK SMITHIES, M. D.,
Gastro-Enterologist to Augustana Hospital; Former Gastro-Enterologist to Mayo Clinic, Rochester, Minn.
CHICAGO, ILL.

There is no known medical cure for gastric cancer. Operative intervention holds forth the only possible hope for individuals affected with this malady. Statistics from surgical clinics of the greatest experience indicate that *one* out of every *nine* patients operated upon dies within 6 months following laparotomy; *two* out of every three are dead within *three* years, and that but *one* patient out of *five* lives longer than 5 years following the most radical resection.

The limitation of life of patients with gastric cancer depends not so much upon the size of the local growth as upon the extent of peri-gastric gland involvement. While it is roughly true that stenosing gastric neoplasms favor the cachexia from cancer poisoning, the problem of the cure of gastric cancer is eminently that of detecting malignant processes before there is an appreciable degree of peri-gastric lymph-gland invasion.

That this is a difficult task for the clinician is admitted, inasmuch as no one has yet shown at what rate or in what sequence, gland involvement takes place in a given case or in groups of cases. Also, no one has ever demonstrated the actual beginnings of primary gastric cancer pathologically. Further, the most experienced pathologists have not been able to show us what biochemic or histologic peculiarity of ulcerated gastric mucosa turns a chronic, calloused ulcer from its normal steps of repair into a progressive process of a malignant nature, with metastatic power. It would seem that in our woeful weakness diagnostically at this point, we have the explanation for much of our therapeutic helplessness.

Yet complete pessimism is not wholly warranted. Twenty-five years ago the operative mortality in cancer of the stomach was stated at 72 per cent. by Haberkant and under the most favorable conditions as 54 per cent. by Billroth. The exceptional case lived longer than three years. The present day statistics of Mayo and Ochsner exhibit less than 15 per cent operative mortality, with a fair lease of life in comparative comfort to those who survive technical surgical procedures. This splendid advance has been made by the surgeon largely as the result, first, of earlier, clinical diagnosis of primary gastric cancer; second, of the realization of the frequency with which chronic, calloused gastric ulcer becomes malignant, or to put things more strongly, the realization of the fact that the group of cancers that can be given help, presents clinically the picture of gastric ulcer itself—that is, the operation has been performed on the "suspicion" of the existence of gastric cancer; and last, the experience gained in properly interpreting laboratory data in the light of modern surgical pathology. It is to the significance of the last factor that we would call attention.

For twenty-five years the laboratory diagnosis of gastric cancer has been interpreted in the light of the classic work of Osler and MacCrea upon 150 cases.[1] Many of their cases were neither surgically nor autopsically proven to be cancer of the stomach. Practically all were late or terminal affections. Laboratory data in their report consisted mainly in the examination of test-meal acidity and the recording of numerous non-related experiments in physiologic chemistry. The momentum of this excellent treatise has carried forward almost to today the impression that "laboratory data" in gastric cancer means diagnosis only of the hopeless tumor—a tumor which is readily palpated in a few seconds. However, Osler himself has recently recognized the state of affairs and states that much that makes up present day text-book knowledge of the disease should be consigned to the scrap-basket.

It is with a hope of contributing a few facts to the readjustment of our conception of what diagnostic signficance laboratory data have with respect to gastric cancer that I submit a brief report of the examination of 700 operatively and pathologically proved cases of the disease from my recent service at the Mayo Clinic and my present records at Augustana Hospital.

Under the term Laboratory Data, I would mention particularly:

1. The information derived from the examination of gastric extracts after test-meals.

*Read before the German Medical Society, Chicago, March, 1914.

2. The information derived from the examination of the stools.

3. The facts shown by blood examination.

4. The facts learned by x-ray studies.

5. The significance of surgical pathologic reports.

1. *The information derived from the examination of gastric extracts after test-meals.*

We have used the double physiologic test-meal to which I have previously drawn attention. The day previous to the patient appearing for his test-meal examination, he is given at 4 p. m., 2 ounces of castor oil. At 6 p. m. he receives a moderate sized meal of mixed food. This meal is given in all cases except those where the history shows severe recent hemorrhage, marked obstruction of the cardia or where the pain from the ingestion of food is very severe. At 9 p. m. the same evening the patient is instructed to swallow 20 raw raisins, swallowing the skins as well as the pulp. If the history does not suggest a retention, on the following morning at 8 a. m. the patient is fed an Ewald breakfast and the stomach emptied in the usual manner at the end of 50 minutes. If the emptying of the stomach at this time shows retention, the secretory power of the stomach should be later determined by washing the stomach clean with normal salt solution and one hour afterwards feeding an Ewald breakfast.

Color. In but 18 per cent of the cases was the removed material or the vomitus dark brown or coffee colored. Many extracts were cream, dark green, yellow or bright red. Where coffee colored contents were noted, there was in 96 per cent a hopelessly extensive process.

Odor. In 65 per cent. the vomitus or test-meal extracts were rancidly sour, an important distinguishing point from the yeastly odor of simple fermentation occurring in benign gastric retention—as ulcer.

Motility. The physiologic motor meal was administered to each of 700 patients.

A twelve hour interval was chosen which eliminated the effect of spasms upon retention of food in the stomach. It was found more satisfactory than the estimation of retained food at the end of a six hour period. When food is kept in a stomach for longer than 12 hours and this retention is persistently demonstrated as a content finding, there is always mechanical interference with gastric emptying power. There may or may not be gastric dilatation coincident with this obstruction.

Twelve hour retention was demonstrated in 504 or 72 per cent. In other words, nearly three out of every four cases coming to the clinic showed some grade of interference with the stomach's emptying power, irrespective of the location of the neoplasm in the stomach wall. This interference with free emptying was almost 10 per cent. more frequently noted in the type of cancer that had followed upon a partly stenosing ulcer, with subsequent dilatation of the stomach, than it was in the cases of so-called "primary" gastric cancer.

Acidity of Gastric Extracts. Gross returns: In but 54 per cent. of the series of test-meals, was free hydrochloric acid absent. In nearly 46 per cent. free Hcl ranged from a trace to as high as 120. One out of every five cases had free Hcl between 20 and 50.

Total acidity ranged above 50 in about 20 per cent. and *combined acid* and acid salts were below 50 in nearly 90 per cent.

These gross returns warrant a more detailed classification because by so doing the diagnostic significance of acidity of gastric extracts is more evidenced. I would classify the cases according to exhibition of primary inoperable cancer; primary cancer which had subsequently ulcerated and gastric ulcer of the simple type which had later become malignant.

Acidity in inoperable gastric cancer. These numbered 436. The average free hydrochloric acid estimation was 7.46. The average total acidity was 28.3. The average combined acidity was 21.0. Lactic acid was present in 62 per cent. of this group.

Acidity in ulcerated primary cancer. So far as could be ascertained, there were 65 of this type. The average free Hcl was 2.0. The average total acidity was 34.0. The average combined acidity was 31. Lactic acid was demonstrated in 63 per cent. of this class.

Acidity in gastric ulcers that had undergone malignant change. These numbered 199. The average free hydrochloric acid estimation was 33.4. It ranged from 4 to as high as 120. The average total acidity was 51.0. The average combined acid was 16.0. Lactic acid was present in but 23 per cent., or in approximately one case out

of five. In 44 instances, serial meals were obtained in this group of cases. These frequently extended over a period of five years. In all but two instances the later meals showed progressive diminution of the free hydrochloric content with increase of the combined acid as clinical evidences of malignancy appeared.

Emphasis is to be especially placed upon the necessity for careful interpretation of test-meal returns on this last group, for this is the class in which gland involvement is least evidenced, and in which the best surgical results are obtainable. The figures returned frequently resemble those shown in simple, chronic, peptic ulcer. However, in a given case, the progressive lowering of free hydrochloric and a corresponding increase in combined acid, associated with gastric motor insufficiency (3 out of 4 cases), is the danger signal so far as improvement by medical treatment is concerned. These cases should be promptly advised to submit to laparotomy, on "suspicion" of malignancy, and not as "cases of chronic catarrh of the stomach" carried on until free hydrochloric acid has disappeared from the gastric extracts simultaneously with all hope of surgical cure or relief.

Lactic acid. In the primary cancer group, this or other organic acid was demonstrated in 54 per cent. of the gastric extracts. In the group of cancers seemingly following a chronic gastric ulcer, lactic acid was present in 42 per cent. To summarize, in only about half of the cases of gastric cancer is lactic acid demonstrated, and where it is present, operative procedures are rarely successful. More than 65 per cent. of cases showing lactic acid revealed free Hcl absent and in 75 per cent. the demonstration of lactic acid was associated with interference with the stomach's emptying power.

Blood. Test for occult or altered blood by the benzidin or the guaiac methods, were positive in 72 per cent. of the total test-meals of the series. It was a somewhat more frequent finding in those cases where ulcer had preceded than where such disease was clinically primary.

Special tests. These were carried out on but about one-third of the gross test-meals. Of the more important we would call attention to the glycyltryptophan test, the Wolff test for soluble albumin and the estimation of the formol index. We have not sufficient observations at hand upon the Abderhalden technique to warrant report.

a. Glycyltryptophan test. We carried out this according to the writer's modification of the Neubauer and Fischer technique in 141 consecutive cases. It was positive in 40 per cent.

b. Wolff test for soluble albumin. In the last 3,750 patients presenting themselves for test-meal examination of gastric function, there were 747 instances where gastric extracts showed achylia or were associated with conditions likely confused with malignancy.[2] These gastric extracts were all tested for soluble albumin by the Wolff-Junghans quantitative method. Records were kept of the association of the results of this test with other test-meal and clinical findings. When the tabulations were completed the operative or clinical diagnosis were entered on the sheets. In 78.4 per cent. of the cases it was possible to obtain positive diagnosis by operative procedure.

Results. The gross results of our work are as follows: Of 747 gastric extracts of the class described above 318 or 42.6 per cent. gave 200 to 400 units of precipitable albumin; 112 or 15.7 per cent. exhibited 160 units and 317 or 42.4 per cent. showed less than 100 units, or were negative. In this grouping 71.5 per cent. of the gastric extracts were from cases showing some degree of gastric retention.

Consideration of the Wolff test in the proved cases of cancer. There were 215 of these in this series. In 141 or 65.1 per cent. the test was positive in 29 cases (13.4 per cent.), the test was suspicious. Combining the returns it is evident that 170 or 78.5 per cent of the proved cases of gastric cancer gave undoubtedly positive or suspiciously positive Wolff-Junghan's test. In 45 cases of 21 per cent. the test was negative.

Gastric extracts from 15 cases of ulcus carcinomatosum were tested. In 11 instances (73.3 per cent.), the test was positive; 3 or 20 per cent. were suspiciously positive. In other words, of the 15 cases of malignant gastric ulcer, 14 or 93.3 per cent. gave either positive or suspicious Wolff test.

Combining the results from the cases of frank gastric cancer and those of cancerous ulcer, it is seen that of a total of 230 cases, 184 or 80 per cent. returned positive or strongly suspicious Wolff tests.

Without going into further detail of our observations with this test, we would state that it

was a more constant finding than absence of acidity, the presence of lactic acid or positive glycyltryptophan test. It was approximately as constant a finding as tests for altered blood and the demonstration of motor insufficiency. It was not so constantly manifested as organisms of the Boas-Oppler type or increase in the formol index. In extra-gastric malignancy and in gastric syhpilis the manifestations of the test were inconstant. In the differentiation between malignant and non-malignant achylias the Wolff test, when interpreted in connection with other clinical and laboratory data proved of considerable value. Positive manifestations were rarely obtained in the achylias of primary anemia, simple achylia gastrica and the simple achlorhydrias where such were unassociated with gastric motor insufficiency. Simple gastric and duodenal ulcers when accompanied by pyloric stenosis or marked dilatation of the stomach gave confusing responses to the Wolff technique.

Estimation of the formol index. Woodyatt and Jacques[3] have recently pointed out that in gastric cancers an ereptic ferment as estimated by the modified formaldehyde titration method suggested by Sorenson and Schiff[4] can be demonstrated in excess in the gastric extract that has been passed through a Berkefeld filter. Our experience with the original procedure is briefly summarized as follows: The average formaldehyde index of 57 cases of proved gastric cancer was 21; the average index of 40 cases of benign gastric ulcer was 10.8 and the average index in 75 cases of duodenal ulcer was 11.9. In 17 cases of achylia gastrica, the average formaldehyde titration index was 14.1. Of 10 cases of pernicious anemia, 14.5 and 5 cases of cancer of the liver, 4.25. It would appear that in some instances, the estimation of the ereptic power of gastric juice toward peptone solutions is of some value when taken in consideration with clinical history and symptomatology.

Significance of the microscopic examination of removed test-meals. We have examined such in the last 158 cases of gastric cancer, by the colored agar method of staining which I suggested some three years ago.[5] We find the microscopic characteristic in nearly 94 per cent. of cases. In this high percentage Oppler-Boas bacilli were found. Yeasts were associated in but 30 per cent. Sarcines in rather more than 10 per cent. This malignant, or bacillary type, of stained smear is sharply in contrast with the simple fermentation type of contents obtained from non-malignant ulcer cases associated with gastric stagnation. When Oppler-Boas bacilli are present, free Hcl is *absent* in more than 80 per cent. of cases, and an abdominal mass or nodule may be detected in three out of four cases. This is a most useful diagnostic observation for differentiation between retention due to cancer and that due to ulcer or extra-gastric tumor.

Stool examination. Ninety-six per cent. of gastric cancers are of the medullary type. These have a tendency to seep blood constantly. Most chronic ulcers bleed intermittently, until they assume malignant character. In 78 per cent. of the gastric cancers, in my series, in which the stool was examined for blood, by the guaiac or the benzidin tests, it was positive. The stools should only be tested after meat-free diet three days, and the patient should be on milk diet the day that the speciment is secured. Sources of blood other than from the stomach must be excluded, and the reaction often given by hemostatic medicines administered by mouth, must be eliminated. Given a chronic gastric ulcer which shows constant evidence of blood in the stools, malignant change should be strongly suspected and operation urged.

Oppler-Boas bacilli can frequently be demonstrated in the stools, but when such are found other more easily elicited signs and symptoms of cancer are not lacking.

When gastric cancers have extensively involved the pancreas, glycosuria or definite diminution in the pancreatic ferments may be demonstrated by such methods as those of Gross-Fuld and Wohlgemuth.

Anemia. The average hemoglobin estimation of 380 of our cases was 72 per cent. It was rather lower in the cancerous ulcers than in cases of primary malignancy.

The average red count was 3,620,000. The average white count was 11,200. Digestion leucocytosis was frequently absent, but not constantly so. The differential count usually showed nothing more marked than a small celled secondary type of anemia. In 19 cases, an excess of eosinophiles might have supported the contention of those who who favor the parasitic etiology of cancer. In 7 cases, the presence of nucleated

red cells had led to previous diagnosis of pernicious anemia.

Value of x-ray examinations. My observations include more than 1,600 consecutive stomach examinations, of which 87 were upon cases of gastric cancer. The examinations were conducted with standard technique by both fluoroscopic and plate methods.

In about 10 per cent of cases, the fluoroscope and plate gave the diagnosis. In more than 82 per cent of our cases, malformation of the normal stomach outlines, with alternation in the peristaltic rhythm were shown by screen or plate examination. Frequently the x-ray examination was of crucial value in locating physically inaccessible tumors, viz.: high on the lesser curve at the cardia and the fundus. In cases of posterior wall growth, we frequently got a confused picture. In the differentiation between gastric and extra-gastric tumors, the screen examinations is often of great value.

The early cases of gastric cancer, or cancerous ulcer rarely show anything typical by x-ray examination. When x-ray plates or fluoroscope shows malformation of the stomach's outline from cancer, other evidences of the disease are not usually lacking. The greatest value of x-ray examination of the stomach is that of sometimes definitely localizing the malignant process and of thus indicating just what group of cancers of the stomach may give prospects of operative relief.

The Surgical Pathology of Gastric Cancer. Adenocarcinomata were demonstrated in more than 96 per cent of instances; colloid carcinomata, 5 times; fibromata, 4 times and sarcoma once. In 27.4 per cent of the cases, ulcera carcinomatosa were shown. These may have been primarily such, had formed from previous chronic gastric ulcer, or may have resulted from surface proteolysis of preceding cancer. It is often impossible to say, without clinical history or test-meal findings, whether an ulcus carcinomatosum developed *as such,* or whether it is a secondary result in primary gastric cancer. MacCarty[6] has emphasized the difficulties of accurately differentiating between the forms of hyperplasia connected with gastric ulcers. He suggests from a vast experience, that hyperplasia is a forerunner of malignancy, that hyperplasia varies in degree, that cancer is malignant hyperplasia, which also varies in degree, and that some degrees of both processes are indistinguishable, histologically.

122 S. Michigan Ave.

REFERENCES.

1. Osler and McCrea: "Cancer of the Stomach," 1900.
2. Smithies: American Jour. M. S., May, 1914, 713.
3. Woodyatt und Jaques: Arch. of Int. Med., 1913, Dec., 560.
4. Sorenson und Schiff: Zeits. f. physiologishes Chemie, 1909, xiii., 27.
5. Smithies: Arch. of Int. Med., 1913, June, 736.
6. MacCarty: Surg., Gynec. and Obst., 1910, May, 440.

THE EARLY DIAGNOSIS OF GASTRIC CARCINOMA.*

OLNEY A. AMBROSE, M. D.,
ST. LOUIS, MO.

The above subject has been chosen for my paper in the main for two reasons: First, on account of the great effort that is being made by investigators to find some method or methods by which a positive early diagnosis can be made; and secondly, my own personal efforts in the matter. It would not be possible for me to go into every detail of this subject, as it is entirely too voluminous. I do want, however, to call your attention to some features that I think are worth while and will be of more than passing interest to you, and to also point out some of the fallacies in our present day diagnostic methods of this disease.

I will not attempt a discussion of the theories of the cause of carcinoma, as you well know that we have not settled as yet on anything definite. Statistics, at best, are very dry and uninteresting, but it is necessary for me to say something along that line.

The stomach is more frequently affected with carcinoma than any other organ in the body, comprising about one-fourth of all cases, and sad to say, the frequency of which is on the increase. According to Welch, in one per cent of all deaths after the age of 20, cancer is the cause. It occurs in men a little more frequently than in women. It is, as a rule, a disease of late middle life, but has been observed as early as the 10th and 18th years. As was formerly thought cancer was a very rare disease under 30, but we find today, on the contrary, that it is very frequent about the age of 30, especially in men who have suffered for some time with so-called hyperacidity, and it is at this age where we so frequently fail to recognize it in its early stage.

*Read before the Egyptian Medical Society, June 12, 1914.

All gastric carcinomata start as a very small nidus, and depending upon whether it is primary or secondary, grow either rapidly or slowly. By primary, I mean where the growth originates in the stomach as a cancer *per se;* and secondary, where it arises from the edge or base of an ulcer. The four types of cancer found in the stomach are adenocarcinoma, medullary, scirrhous and colloid. The most frequent location for these growths are in the following order: Pylorus, lesser curvature and cardia. Likewise the same state of affairs exists with gastric ulcer. Consequently, the great necessity of recognizing and curing all gastric ulcers in their incipiency. The Mayos have shown that 75 per cent of ulcers of the stomach are malignant, and I am firmly of the opinion that future investigation will show the percentage to be even greater than this, although I am well aware of the fact other authorities do not consider the percentage so high.

I desire now, in order to lay the foundation for my statements a little later, to first call your attention to the usual symptoms and methods of diagnosis as set forth in the average text-book on medicine and by whose authority the man in the general field is directed, and it is he to whom the great majority of all patients first apply.

Let us now take the most important symptoms and findings that we are in the habit of relying upon. We do not think of cancer unless the individual is past 30. This is the age at which malignant ulcer is frequent. Sudden loss of appetite with a pronounced distaste for meats of all kinds is, as a rule, a late symptom. Vomiting of blood, if due to malignancy, generally means obstruction and is a late symptom. Pain which is more or less continuous in the epigastrium, does not tell you much, as it is a symptom of numerous gastric conditions. Vomiting of vile smelling coffee-ground material, etc., always is a late symptom. Symptoms of stagnation, belching of gas, distress after eating, if due to carcinoma, are always late. Secondary anemia and cachexia are never early symptoms. A growth palpable in the epigastrium, if malignant, is always a late symptom. This growth, however, may be a syphilitic gumma or a calloused ulcer. Benign growths do not interfere with the general health of the individual until they have produced marked obstruction. Loss of weight is never noticeable early, but would be a valuable symptom if systematically considered, for the reason that the individual who has a steady decline in weight in conjunction with a digestive disturbance should be looked upon with suspicion. Hemorrhage is a late symptom and is only seen in 50 per cent of the cases.

Gastric Findings—Test meal shows poor digestion with small return. Lactic acid present, with Oppler-Boas bacilli; free hydrochloric acid absent. These findings are only present after obstruction has taken place, for the reason that lactic acid and the bacilli above mentioned are products of stagnation and decomposition found late in the disease only. The triptophan and Solomon tests are only of use when positive, and whether or not they are ever of any use in making an early diagnosis is questionable. To summarize them, the great majority of the findings that we have relied upon avail us but little. What, then, can we do in order to detect malignancy of the stomach early enough to be of benefit to the sufferer?

First: I would insist that all calloused ulcers be excised as a matter of prevention, never relying merely upon a gastro-enterostomy to drain the stomach, as a drainage operation without the removal of the cause would avail us but little.

Secondly: That we impress our stomach patients with the great necessity of obtaining a cure in the beginning of any so-called digestive disturbance, and the further admonition that they must remain under observation a sufficient length of time under any treatment you may give them, whether it be medical or surgical, in order that you may carefully observe their progress.

The history of the individual, if carefully taken, is the first thing we rely upon in correlating the early findings. Any one past middle life who tells you that he has never had any stomach trouble until a sudden so-called indigestion came on, and which he is having great difficulty in relieving—that he has been in perfect health up to this time; or, on the other hand, that he has been having trouble with his stomach off and on for some time, that the condition is rapidly growing worse even under his physician's direction, and that he apparently is receiving no benefit or relief—such statements should never fail

to arouse your suspicion of malignancy. Further, an individual who complains of a stomach condition which does not respond to proper medical or dietetic treatment within six weeks' time should be looked upon as suffering with an organic stomach lesion until proven otherwise, for, as a rule, with such a state of facts as I have noted, you will find that you are dealing with an organic disturbance and not a functional one, and the first thing you should always think of is malignancy.

In respect now to the chemical findings in the early diagnosis, we first make repeated gastric analyses in all patients that arouse our suspicion, as a steady decline in the hydrochloric acid content, free and total acid, is highly suspicious. This is noticeable even before the clinical symptoms tell you anything. Every patient is always prepared for the examination for occult blood in the feces. For three days prior to your expected examination, he is allowed no meat of any kind, no drugs, and is advised to use a tooth brush very lightly. His mouth and teeth are examined to see whether or not he has bleeding gums, and if this is the case, these must be treated before you can expect your test for occult blood to be of any value. We are in the habit of making use of at least three tests for blood in the feces and gastric contents, in order that one may be a check upon the other. The continuous finding from time to time of occult blood in the stool is a very early symptom. Further, we give the patient an Ewald test meal which is extracted in one hour in the following manner: A tube with two lateral openings at the end, without any other lubrication than the saliva, is introduced very rapidly in order to prevent retching, and only a small amount of the test meal is extracted, as any attempt to obtain it all will cause your patient to vomit. This is examined for blood, pus, bacteria and quantitatively for hydrochloric acid. Pus is not a product of a normal stomach, and when found, should always be looked upon as a pathological condition. In order to make the examination for pus and bacteria of real value we introduce into the stomach a normal salt solution and withdraw it in twenty minutes, examining same microscopically.

Knowing that cancer always ulcerates early, and the finding of cancer cells being, of course, positive proof of malignancy, a new test has been devised by Loeper and Buret, two Frenchmen, whereby they endeavor to obtain cancer cells in the wash water from the stomach in the following manner: Into the fasting stomach through a stomach tube a quart of physiologic salt solution is poured. The stomach is massaged for a few moments and this solution is then immediately withdrawn. This is centrifuged and repeated examinations made microscopically for the cancer cell. In my opinion this test is thoroughly worth while, and if done systematically, is a big step in the early detection of carcinoma.

The x-ray has been the biggest factor in enabling us to make an early diagnosis of malignancy. We are in the habit of examining every individual who presents himself with the fluoroscope in order to observe the working of the stomach from time to time, and I might say that this has been so perfected that we are now enabled to study the stomach without any danger to either ourselves or our patients. If it becomes necessary, we make serial radiograms in order to study the picture at length. We know that the normal stomach has certain definite conditions and movements and that its normal emptying time should be six hours or less; that it should empty itself with a slow, deliberate, peristaltic movement; that a normal stomach has a wide range of position in so far as its body is concerned, but that the slightest interference with the position of its pyloric end always means something to us. Our technique is to give the patient a meal of insoluble barium sulphate and first examine for five or ten minutes fluoroscopically. If the gastric analysis had shown that there is a diminution of free hydrochloric acid we notice that the stomach empties rapidly and without severe peristaltic movement, providing that there is no obstruction at the lower end. It has been proven that it is the hydrochloric acid which activates the opening and closing of the pylorus. We therefore make our gastric findings a check on our x-ray findings in the following manner: If, at the end of six hours we see fluoroscopically a normal stomach shadow with a small amount of barium still in the stomach and a gastric analysis shows absence of hydrochloric acid, we make a diagnosis of a small pyloric carcinoma.

The above is used merely as an example as we make use of a number of what we term "Symptom Complexes" in arriving at a diagnosis of early carcinoma, as well as gastric and duodenal

ulcer. Time will not permit me to go into the details of all these different conditions. I wish to say, however, that 85 per cent of the organic lesions of the gastro-intestinal tract can be diagnosed by the x-ray method.

In conclusion, I will say that if we are to arrive at an early diagnosis of malignancy, we must apply all the known methods, making one a check upon the other, and under no consideration to allow ourselves to rely upon any single method. If we can come to an early conclusion, we know that surgical measures will place our patients in a position to make a complete recovery, and even if not a recovery, it will prolong their lives and make them comfortable, a thing that has not been done in the past. There is no medical treatment with which we can offer a cure for malignancy. We can, however, work along preventive lines, and the time is not far distant when the public will be educated to apply early to their physician for all stomach conditions just the same as they have been educated to apply early when they are threatened with tuberculosis. When that time does arrive, we will see carcinoma on the decline instead of on the increase.

Lister Building.

ANTI-SPITTING SIGNS AND THE CONTROL OF EXPECTORATION.*

ADOLPH GEHRMANN, M. D.,
CHICAGO, ILLINOIS.

Laying aside all that pertains to disease by direct transmission of bacteria through the medium of mucus from the respiratory passages—the possibilities of which we recognize—the spitting nuisance is a subject for urgent sanitary consideration.

Whenever a newly-appointed health officer assumes the duties of his office, he is likely to consider a crusade against spitting as one of the features of his administration. Often a plan is laid out and entered upon with vigor, but soon falls flat because little is accomplished outside of the immediate agitation and warnings for a few individuals.

The care of the human menagerie presents two fundamental requirements; *first*, the essentials of food and feeding, and, *second*, the removal of excrement. The most distinctly animal characteristic remaining generally in the human is the slight regard that he shows in the disposition of expectoration and excretions from the mouth and nose. The fulfillment of other functions is so far under mental control that they do not, except in an isolated way, present to sanitation problems at all analogous to those occasioned by the expectoration function, as it may occur in any group of individuals. In view of our present state of knowledge regarding the expectorate, the subject of its proper disposal is the most colossal problem, and the most far-reaching improvement to be achieved by modern hygiene and sanitation.

If we consider expectoration from its scientific aspect, we see a function and not a habit. It may have the character of habit at times, but fundamentally it is an essential activity of existence. Like all functions, its accomplishment is a necessity and will not permit of suppression. The fact that man generally has failed to distinguish the decent and indecent in expectoration is, indeed, a blot on the escutcheon of modern civilization and education. The failure lies in the absence of provision for accomplishing a function and a general apathy to consider sputum excrement. People do not care. Everybody spits. Why should one step aside?

Anti-spitting signs are now posted in most communities in this country. There is a great difference in the types of signs used. The most common wording is the forbidding sign, often with an announcement of the law and a statement as to the possible fine that may be imposed. There is generally an absence of information that is to be a help to the public. This point has been generally overlooked. In all sanitary improvements we can best accomplish success by securing intelligent assistance from the public itself. We cannot have a boy with a sprinkling-can run after people and disinfect sputum or gather it up as we do for horse manure. We must use every means to get people in a way to help themselves.

The control of the expectoration nuisance can be undertaken along several lines of activity in the work of a health department:

1. Education.
2. Compulsory activity, arrests, etc.

*Read at the sixty-fourth annual meeting of the Illinois State Medical Society, Section on Sanitation, Decatur, May, 1914.

3. By offering convenience to care for the function.

4. By persuasive means, as the anti-spitting crusade.

5. By keeping public places in such good order that cleanliness will be the determining factor.

6. The influence of popular habits, as gum chewing, or like practice.

Education.—The educational campaign against expectoration must be with the children. It is useless with adults. Dr. Knopf, in the International prize essay, has recommended a leaflet called the alphabet, in which each letter represents some fact in the anti-tuberculosis campaign, and covers care of mouth and nose mucus. The end of the use of slates, sponges and drinking-cups, and the general instruction that objects must not be put in the mouth, go a long way towards gaining an attitude of mind to develop decency in regard to spitting. Where the authority is sufficiently respected, the spitting nuisance can be stopped at once. This was done at the slaughter houses in the Chicago Stock Yards after the "Muck Rake" investigation in 1906. It was there made a rule not to spit except into cuspidors, and the rule was enforced. We all know that medical colleges especially were in an awful condition because of the bad practice of students. In the College of Medicine of the University of Illinois the usual conditions as to smoking and spitting pertained until President James issued an order forbidding the same, and at once the condition changed, because the students recognized the authority of the regulation. Such rules can be made effective in schools, shops or business places where we are dealing with the same groups of people, but the general public is hard to handle, and cannot be regulated in so easy a manner.

Compulsion.—Generally, compulsion by arrest, fines and threats under ordinance regulations has been a failure. The difficulty is that in the first place people pay little attention to such laws; secondly, it is very difficult to secure evidence, and then only the worst offenders are captured; thirdly, it is difficult to prove in court that an injury has been done; fourthly, it is an expensive and annoying method to accomplish the purpose.

Conveniences.—If sanitation purposes to offer protection against sputum as a factor in the spread of disease, it must plan out some method of disposal. The ultimate aim of sanitation should be to prevent untreated sputum from getting away. It should go with sewage. We should try to get it deposited in drains, and here its disposal is as a part of other excrement disposition. The ordinary cuspidor is at the present time an apparent necessary nuisance. The time will come when it will be abolished. This is necessary because of its free exposure and the dangers that accompany cleaning. Places to spit: The gutter outdoors is an almost universal cuspidor, while, indoors, stationary flushing cuspidors are to be recommended, and, if movable, they should be provided with lids. All toilets are cuspidors, a fact little thought of by people in general. The cuspidor that is often placed in a toilet is in itself a menace by attracting flies and often making the place unbearable.

Persuasion.—"Join the Anti-Spitting Crusade." Many people have good intentions, but they do not follow the principle when alone and free. It takes a special mental attitude to follow a precept through a day's activity and live up to what we may know to be right. The Anti-Spitting Crusade is a good, popular way of stating the subject, and in time will have many adherents. However, it only reaches a small class of wide-awake people and is passed unnoticed by the masses. Such a crusade is also spasmodic and exerts a good influence only over short periods. As in all crusades, it is the novelty of the situation and idea that makes it go. If a crusade is undertaken it should be on a wide scale, so as to reach all classes and places in the community. It is almost impossible to find the last place where an improvement cannot be introduced for sputum disposal. It is not always easy to spit straight, even with good intention. All the different restrictive and preventive measures, as care of the fingers, mouth and nose, proper use of handkerchiefs, when and where to spit, and the danger of disease dissemination may be fully covered to advantage in such a campaign.

Cleanliness.—A man does not like to spit on a clean floor. If it is dirty, he will spit at once. If it is clean, he usually goes over and spits on the wall. No better example of a changed condition can be found than the difference between the old Northwestern Railway Station in Chicago and the new station. The old station was probably the dirtiest in the country, while the new one is so clean that one hates to make it dirty, and it remains clean.

Habits.—The reduction of the extent to which chewing tobacco is used is having an influence on expectoration. There is a widespread substitution of chewing gum for tobacco. To chew something is a general characteristic of mankind. In every country or clime, some form of chewing is practiced. In some, nuts or berries are chewed and the hulls or seeds spit about. The use of gum is in many ways a sanitary improvement. It is cleanly and there is less tendency to spit while chewing gum.

As more infections begin by an invasion through the mucous membrane of the mouth and nose than by any other atrium, the public should be instructed as to the dangers from sputum, and the means of disposing of it. Our publicity campaign cannot go too far, because spitting is so frequent and promiscuous that attention must almost be continuously directed against it. Facilities should be provided and the people should be instructed to use them. The wording of signs ranges from a simple command not to spit to elaborate instructions and extracts from the laws and ordinances, and sometimes the amount of the fines that may be imposed. Generally, these signs can be greatly improved by making them instructive rather than forbidding signs. Usually the public is looking for help. We should consider them a menagerie by providing conveniences and helping to have them used. The display of signs is to be carefully studied, and this will make a great difference in the effect that they will have. It is suggested that a printed card be handed to offenders. People generally take offense when asked not to spit, and even purposely break the rules from a general feeling that it is an interference with personal liberty. Again, others are too lazy to exert themselves in making proper disposal. The bad habit of spitting into a corner is even the result of signs, because some people like to hide their misdemeanor. Generally a sign makes an impression, whether it is obeyed or not. The display of signs can go as far as is done in Milwaukee, where every telephone pole has a sign forbidding spitting on the sidewalks. The signs there are of metal, like advertising signs. The signs displayed in cars, railway coaches and buses do very little good, because the passengers are often obliged to keep their seats, and, therefore, spit in the corner, because they cannot get out. It is well-nigh impossible to prevent this. To achieve perfect sputum disposal a sentiment must be developed, means for proper spitting provided, and some of our apparently fixed customs altered.—*Department of Hygiene, College of Medicine, University of Illinois.*

METASTATIC INFECTIONS.*

J. A. Colteaux, M. D.
ROBERTS, ILL.

These infections are very common and many times overlooked, or are confused with the term rheumatism.

They usually begin as a tonsillitis, pharyngitis, laryngitis or any respiratory infection with the following bacteria or cocci, such as staphylococci, streptococci, pneumococci, diphtheria, etc.

They are ushered in with a chill, fever, headache, general malaise, followed in from 5 to 10 days with a metastatic infection in some other part of the body, such as joints, kidney, gall bladder, liver, spleen, urinary bladder, prostate, or any of the sinuses.

At the beginning of this metastatic infection you usually get increased temperature and exaggeration of the previous infection, higher temperature, distinct chill, etc. Taking for instance a joint, we will say the knee, which is usually one of the most often involved, patient complains of pain while walking or standing. Later on contraction of the muscles takes place, which is nature's way of immobilizing the joint. Later on he is unable to move the joint without excruciating pain. In the joint we have local signs of inflammation such as redness, heat, swelling

*Read at annual meeting of the Iroquois-Ford Medical Society, Dec. 1, 1914.

and pains, and at times an effusion into the joint. If this condition is let run we have an involvement of the ends of the bones with a plastic exudate which later on develops into a complete ankylosis. Going back to the primary infections we have one which is very common, the gonococcus. About the 18th day after the primary infection is the time that metastasis takes place. Usually the knee, hip or ankles are involved. With this you also get the usual signs of infection as stated before.

Time prevents me from going further into the infectious nature of each group of bacteria, their favorite places of infections, and also the pathology. I will now take up the treatment of the joints especially, as they are the most neglected or overlooked parts of the anatomy. Usually they are called a rheumatic joint in which large doses of salicylates are given and continued until after the joint tissues are destroyed and an ankylosis is unavoidable.

After you get an involvement of a joint, we will say the knee, put the patient to bed immediately, keep up elimination, use vaccines if necessary; but the most important part is the treatment of the joint itself. After patient is in bed, put on a Buck's extension of about 20 or 30 pounds in weight (the weight depends on the musculature of the patient. If there is effusion in the joint causing much tension, you must relieve the tension at once, first by applying Buck's extension, which separates the joint surfaces. If this does not give you the required relief, aspirate the joint and inject from 10 to 20 CC. of a 2 per cent. formalin in glycerin, which should be at least 24 hours old. This cofferdams the lymph spaces, and makes the joint as near aseptic as possible. If the effusion returns, aspirate in 48 hours and re-inject. Do not inject over three times. Let two days elapse between the second and third injection. Immobilization, aspiration and injection are absolutely useless, unless Buck's extension is applied to separate the joint surfaces. After acute inflammatory condition of joint has passed over, put on a splint or cast and keep immobilized for 2 or 3 weeks longer, not allowing patient to use limb.

A RESUME OF LITERATURE SHOWING INFECTION AS THE CAUSE OF RHEUMATISM, ENDOCARDITIS, ARTHRITIS DEFORMANS ULCER OF STOMACH, AND CHOLECYSTITIS.*

S. S. FULLER, M. D.
PAXTON, ILL.

I beg to make an apology for presenting a paper upon this subject. For several years I have been especially interested in watching the experimental work of E. C. Rosenow, of the Memorial Institute for Infectious Diseases, Chicago, from the time he began his work upon the pneumococcus. When I was asked to write a paper, this subject presented itself and that you might have first hand and authoritative information upon this probably the most important discovery of modern medicine, I asked Dr. Rosenow to present a paper. For pressure of time, he declined, so in my feeble way I will try to bring to your especial attention some of his work.

The clinical evidence of the infectious character of acute rheumatic fever is quite convincing. The nature of the more chronic forms of the disease, however, and of the allied conditions, such as chorea, rheumatic iritis, erythema nodosum, and erythema multifome, is not so clear.

A large variety of organisms have been isolated from the lesions in rheumatic fever. Achalme and others isolated from cases after death a large gram staining bacillus. Tribloulet and Coyon cultivated a diplococcus in five cases, pure cultures of which caused arthritis and endocarditis in rabbits. It is now generally held that the bacillus of Achalme is identical with the bacillus Welchii (B. aerogenes capsulatus). Meyer was the first to demonstrate that the streptococci associated with the relatively mild tonsillitis in rheumatism commonly produce arthritis, endocarditis and pericarditis of the rheumatic type in rabbits. Others have isolated streptococci or diplococci quite uniformly from lesions in rheumatism after death, but only in a limited number of cases during life. These organisms closely resemble other streptococci morphologically and culturally, but when injected into animals, produce effects quite different from those obtained by the injection of

*Read at the annual meeting of Iroquois-Ford Medical Society, Dec. 1, 1914.

organisms coming from other sources than rheumatism. The experimental disease resembles very closely the disease in man. That rheumatism is a streptococcus disease, is further indicated by the work of Tunnicliff on the opsonic index; by the fact that the myocardial lesions produced experimentally by Coombs and others with the streptococci from rheumatism, are identical with those described by Aschoff and Tawara as characteristic of rheumatism in man; and by the fact that hemolytic streptococci, as shown by Jackson, and streptococcus viridans, as shown by Rosenow and Coombs, produce similar, although in the case of streptococcus viridans very much smaller lesions in the myocardium of rabbits, following intravenous injections of the respective strains.

The affinity for joints of streptococci from other sources than rheumatism has been emphasized by several. The arthritis following injections of these streptococci is often monarticular; the exudate contains many cocci; suppuration and deformity occur; endocarditis and pericarditis develop only occasionally, while a grossly visible myocarditis has not been described.

By injecting mixtures of hemolytic streptococci and streptococcus viridans, Rosenow has repeatedly produced arthritis and endocarditis in the same animal. The arthritis was proved to be due to hemolytic streptococci, and the endocarditis to streptococcus viridans. But even here a gross pericarditis and myocarditis have not been observed.

A careful study of the protocols of the animal experiments performed by the investigators in these respective fields shows clearly that the results following injections of streptococci from rheumatism and streptococci from other sources, respectively, correspond quite closely to the differences observed clinically in articular rheumatism, on the one hand, and streptococcal arthritis on the other. In spite of these facts, however, the view that rheumatism is due to a specific streptococcus has not been generally accepted because so many investigators have failed entirely or only rarely obtained the organism. And, finally, no one until recently has isolated the organism in a considerable number of consecutive uncomplicated cases of rheumatism during life.

As further evidence that streptococci are commonly associated with rheumatism, it should be stated that Rosenow has recently been able to isolate streptococci from the slightly enlarged but hyperemic extirpated lymph glands, draining the joints. In the glands, the streptococci have been found during convalescence long after they have disappeared from the joint exudate. It should be pointed out that although the strains isolated tended to fall in three distinct groups, all behaved differently in one respect or another from the usual streptococcus viridans and hemolytic streptococcus. By inoculating rabbits and dogs as soon as an abundant growth could be obtained, the chief point of difference from streptococci isolated from the usual sources was shown, not only by their simultaneous affinity for the endocardium, pericardium, myocardium, and joints, but by their localization in the animals in sites corresponding roughly to those in the case from which they were isolated. Thus the strains isolated from cases without muscle involvement never produced muscle lesions, but endocarditis and arthritis, and sometimes pericarditis, while those strains isolated from the lesions in the muscles in man as well as those isolated from the joints in cases showing definite muscle involvement, produced in addition to endorcarditis and arthritis, a non-suppurative myositis and a pronounced myocarditis.

The close relation which exists between rheumatism and chorea in man is paralleled to a degree by the animal experimentation. That chorea is due to a streptococcus, having peculiar properties, has recently been quite conclusively shown by Dick and Ruthstein.

Experimental evidence has been produced which goes to show that probably lodgement in the fine capillaries of the iris occurs in rheumatic iritis, and that muscular rheumatism, or rheumatic myositis, is commonly due to streptococci closely related to those found in articular rheumatism.

It must not be supposed that the streptococci associated with rheumatism are a group of organisms far removed from other streptococci, or that they are necessarily specific for rheumatism. The fact that certain strains of streptococci change more or less in their cultural and other properties under various conditions, is quite well known and Rosenow has shown that the organism from

chronic septic endocarditis, streptococcus viridans, can by animal passage be converted into the pneumococcus. It is generally understood that the streptococcus viridans is an intermediate organism between pneumococcus and streptococcus hemolyticus, and by appropriate means he has now transformed one into the other and vice versa with intermediate forms of which the streptococcus viridans is the most typical.

Owing largely to the work of Davis and Billings and others, it has been shown that the hemolytic streptococci have a marked affinity for the joints of animals and man. The transformed streptococcus viridans loses its affinity for the joints and acquires a marked affinity for the heart valves, while the same organism becoming transformed into a typical, lanceolate, encapsulated, highly virulant pneumococcus, produces now, neither endocarditis nor arthritis, but a rapidly fatal pneumococcemia instead. After transforming hemolytic streptococci, streptococcus viridans, and pneumococcus one into the other, Rosenow felt that if there is such a thing as a "streptococcus rheumaticus," he must find it if possible and determine its relation to the other members of the streptococcus group. By appropriate means he has been able to do this.

There is an affinity of streptococci for the mucous membrane of the stomach and duodenum in rabbits, dogs and monkeys, which, while not so striking as that for the muscles, is nevertheless definite and is shown usually at a grade of virulence a little higher than when the affinity for the muscles is greatest. The fact that the grade of virulence is such as not to give a picture of a generalized infection, that the type and localization of the ulcer is strikingly like the ulcer of the stomach in man, together with clinical observations, suggest strongly that this may be the cause of ulcer in man. The results are such that the ulcers are not to be considered accidental, because they occur commonly, only when the streptococci of a certain grade of virulence are injected. This is a very important finding and changes our entire conception of the etiology of ulcer of the stomach.

At about the grade of virulence when streptococci show the affinity for muscles and stomach mucous membrane, they show an affinity for the gall bladder. Rosenow has now isolated the specific streptococci from the wall of an infected gall bladder and invariably produced cholecystitis in lower animals as he has personally shown me. This opens up the etiology of another disease heretofore little understood.

The fact that one form of streptococcus may be changed into another with entirely different properties is good evidence against the view held by some that the streptococci found in the joints in rheumatism are merely secondary invaders, and that the real cause is still unknown. The experiments show further that when these and other streptococci are grown in symbiosis with other bacteria and under a varying degree of oxygen pressure, they may acquire new features. The place in the human body where such conditions prevail, and where special features are likely to be acquired, are foci of infection such as occur in the tonsils, various sinuses, the appendix and infections about the teeth and gums. That changes in the character of the bacteria actually occur in the tonsils in rheumatism seems quite clear; the mild character of the tonsillitis at the time of the attack, and the late appearance of rheumatism in some cases of acute follicular tonsillitis (streptococcal) support this idea. The focus may be unusual, such as an injured thumb or an ingrown toe nail.

While it is true that acute rheumatic fever has a distinct clinical picture, it is equally true that certain cases, especially the more chronic form of the disease, can not be differentiated from the early stages of some cases of arthritis deformans. Again, certain cases of chronic infections endocarditis follow in the wake of acute rheumatism.

Recently Rosenow has had opportunity to study the streptococci isolated from the glands draining the involved joints in arthritis deformans, and finds that these organisms have distinctive cultural and pathogenic features which are in keeping with the type of disease produced in man. From these facts it is clear that the character of the disease produced, and the location of the lesion, depend to a very large degree upon the character of the infecting streptococcus. There is, on the other hand, good evidence that peculiarities of the infected individuals, especially those liable to repeated attacks of rheumatism, play a role. For some reason these in-

dividuals seem to be susceptible or react peculiarly toward this group of streptococci or otherwise furnish conditions such as foci of infection which favor the entrance into the body and acquirement of the special features by these organisms.

CONCLUSIONS.

1. There is a wide range of organisms of the streptococcus family that may be derived from the pneumococcus and transformed from one into another.

2. The different strains of the organism have different virulence and different affinity for the various parts or organs of the body, each strain having a specific action producing a specific disease. These diseases are often associated.

3. There is some point of infection in the body, such as the tonsils, gums, teeth, sinuses, etc., where these changes in the organism take place, acting as feeders to the system producing the different pathological conditions.

4. The different diseases coming under this group are: rheumatism (muscular and articular) and associated diseases such as chorea, rheumatic iritis, erythema nodosum, and erythema multiforma, arthritis deformans, endocarditis, ulcer of the stomach, cholecystitis and possibly ascending pyelonephrosis not heretofore mentioned.

5. A great many diseases and their complications are to be avoided by attending to the focus of infection. This means that particular attention is to be given to the upper respiratory tract in keeping it in a healthy condition. If carcinoma of the stomach has its beginning in a chronic ulcer of the stomach, as is now firmly believed, this will have a far reaching effect in cutting down the large number of these cases.

ACUTE INFANTILE OTITIS.

E. E. Woodside, M. D.,

MARION, ILL.

In order to prevent this paper from reaching an unbearable length, it has seemed wise to limit its scope to the consideration of acute otitis occurring in infancy and childhood. No attempt will be made to differentiate between the catarrhal and suppurative forms, or to discuss the more minute phases of etiology and pathology, which have an interest only for the specialist. I have in mind only to present a short and if possible, a practical paper, that will help you as busy, practicing physicians in these, many times troublesome cases.

I think we can hardly overestimate the value of a correct diagnosis and early treatment in these cases, if we consider that improperly treated cases many times go on to mastoid involvement, meningeal involvement, internal ear involvement, and brain abscess, as well as oftentimes passing into the chronic discharging ear with its troublesome features. These sequelae can largely be prevented by early and appropriate treatment. The responsibility rests mainly on the family doctor, as it is to him the parent usually applies first for relief.

The occurrence of otitis media in infancy is principally favored by the anatomical conditions of the auditory duct and by the greater prevalence of adenoid tissue around the mouth of the duct. The Eustachian tube of the infant is a short, wide and relatively horizontal canal, the pharyngeal orifice of which lies a little behind the choanae and on a level slightly below that of the hard palate. Its physical characteristics seem, therefore, as compared with the adult tube, particularly favorable to the entrance of germs from the nasal secretion draining posteriorly into the pharynx and to the development of vascular changes as a result of any pathological condition within the nose or nasopharynx.

Named in order of their importance the exciting causes of acute otitis are: 1 Nasopharyngitis—the common "Cold in the head." More cases are secondary to this affection than probably any other. 2. The acute exanthemata; scarlet fever, diphtheria and measles cause acute tympanic disease with even greater frequency than we sometimes believe. Scarlet fever causes more cases than the other two and more of its cases go on to mastoid involvement. Acute influenza gives rise quite frequently to middle ear disease of a severe type. 3. Hereditary constitutional affections such as tuberculosis, syphilis, rachitis and alcoholic heredity. 4. Traumatic injury of the middle ear before and during birth. 5. Coughing, sneezing and vomiting, forcing foreign substances through the tube into the tympanum.

A long list of micro-organisms have been found in the secretions in otitis. Named in

order of frequency are streptococcus, pneumococcus and streptococcus musosis, staphylococcus, albus and aureus, bacillus proteus and pyocyaneus, etc.

As regards virulence, there is no room for doubt that the strepto and pneumococcus give rise to a middle ear involvement which leads more frequently to intracranial complications than any of the others. It has been held that the staphylococci do not cause intracranial complications, which is an extreme view but is certainly rare compared with those due to strepto and pneumococcus infections.

Before discussing clinical symptoms I should like to mention certain anatomical points that bear on the symptoms and course of the disease. The cavity of the atrium is lined by an exceedingly thin membrane adhering closely to its bony walls. Externally the atrium is closed by the tense, inelastic portion of the drum membrane. Superiorly the atrium is more or less completely separated from the tympanic vault by the structures massed in this situation, viz.: ossicles and their ligaments with the mucous membrane which envelops them. From the anterior walls of the atrium the Eustachian canal leads forward, inward and downward into the nasopharynx.

An inflammatory process originating in and confined to the atrium represents changes taking place in the following manner: 1. Marked dilitation and engorgement of the vessels in the lining membrane. 2. Transudation of serum and migration of leukocytes from the veins into the mucoperiosteal lining. The consequent inflammatory thickening of the lining membrane has the important mechanical effect of rendering the separation of the atrium from the vault more complete. The Eustachian tube is also more or less completely closed by the inflammatory swelling in the region of the tympanic orifice. With the formation of pus or effusion of serum into the atrium, the walls of that cavity are subjected to pressure. The outer wall or membrana tensa offering less resistance soon bulges. Hence, the sometimes early rupture of the drum membrane.

When acute otitis occurs as a complication of one of the acute infectious diseases, the otitic symptoms may be masked by the general disease. When on the other hand the otitis is not secondary to systemic infection, the onset is usually sudden and clearly defined. As a prodromal symptom, which may be noted by older children, a sense of fullness may occur. Usually, however, the symptom first noted is that of pain. The earache is usually sudden in its development. Following a few premonitory twinges, it soon assumes a character of constant pain which rapidly reaches an unbearable degree of severity. Not infrequently the patient retires at night with no noticeable discomfort, to be awakened during the night or towards morning by the severity of the ear pain. Once established the pain is usually constant but is subject to exacerbations of intensity. With the beginning of pus formation the pain becomes "throbbing" or "drawing" in character. The severity of the pain often distracts the patient's attention from the minor symptoms. If questioned, however, he usually becomes conscious of subjective sounds; tinnitus aurium. The hearing is impaired.

With infants and young children even the mildest type of middle ear infection is usually announced by rather high fever, varying from 102 to 105. Digestive disturbances are common during the early stages of an acute otitis.

The possibility of overlooking an inflammation of the middle ear is increased by the helplessness of the infant. It is not before the fourth month that the infant directs attention to the possibility of an auricular infection by rubbing its ear, putting the hand to the head, crying when the ear or its vicinity is touched or even avoiding lying down on the affected side. Exacerbation of pain when sucking often interrupts the feeding, the patient giving vent by crying. Up to that age, however, all motor reaction may be absent and the diagnosis only cleared up when a discharge of pus is found in the external canal. Sometimes it takes as long as 10 days or two weeks for the tough membrane to become ulcerated and to rupture.

It is important that a careful otoscopic examination be made in every unexplained febrile affection of childhood. This requires proper care, patience and suitable light and instruments. The external canal should be syringed free of all accumulations of cerumen and epithelial debris, until a clear view may be had of the drum head. A good light is essential. The child's head should be rigidly held. The specu-

lum should be small enough to fit well into the canal.

The otoscopic picture varies with the stage of the disease at the time of the examination. If seen early enough the first injection occurs in the vessels along the handle of the hammer and the circumference of the membrane. Very shortly afterward the entire drum will appear red, very red, the deeper injection in the upper part. A few hours later the whole drum is not only distinctly red but bulges toward the external canal. A small central depression may be noted in the region of the umbo. The remaining landmarks are usually entirely obliterated at this stage. The examination still further delayed we usually find the canal filled with pus, which indicates that our drum membrane has been perforated.

With painstaking observation of the patient and careful otoscopic examination, there can be no difficulty in the diagnosis of infantile otitis provided the physician considers the possibility of otitis media in infants and young children at a sufficiently early stage.

The prognosis is favorable in otherwise robust, well nourished children both for the simple and suppurative otitis media. With proper care in the great majority of cases, the organ will be completely restored without any impairment of hearing.

In debilitated, under nourished, rachitic infants, there is some danger of the acute developing into the chronic form with permanent changes even after later healing. This is true in cases seen late, or neglected. When the suppuration becomes chronic it often leads to moist eczema, and constriction of the auditory duct, with consequent retention of pus in the middle ear, ulcerous processes of the mucosa, formation of granulation and polypi, carious changes of the auricular vessels and osseous walls of the middle ear, with all their sequelae.

The treatment of infantile otitis hardly differs from that of adults. Early paracentesis is important, as its omission may be responsible for mastoid and intracranial involvement.

The paracentesis should be more than a simple stab of a needle. It should be a full free incision beginning well up to the posterior fold and extending downward through the inferior margin of the membrane and into the skin and periosteum of the floor of the external canal. No known drug will render the inflamed drum anesthetic sufficient for a thorough and painless paracentesis when applied locally. A general anesthetic, preferably with nitrous oxid gas is essential to good results.

After paracentesis it is essential to keep the canal free of pus by syringing frequently with warm sterile solutions of normal salt and by traction by sterile gauze wicks carried down to the opening in the drum.

Non-operative treatment is indicated in a very small percentage of the cases and in the very earliest stages of others. The so-called abortive treatment may be tried when the case is seen very early before there is any bulging of the membrane. This treatment is to put the child to bed, induce free catharsis and strictly liquid diet. Syringe the external canal free with hot normal saline. Fill the cavity half full of hot 5 per cent. phenol in glycerine. The usual ear drops of sweet oil and laudanum and all other oily preparations should religiously be kept out of the ear. Heat is very grateful to the patient when applied to the ear in any form. A good prescription to take home with you is chloroform and olive oil equal parts. About a teaspoonful poured on a large piece of cotton and held over the external canal will many times work wonders in relieving the pain.

When pain is not relieved within a reasonable length of time or when the drum membrane is seen to bulge into the canal from pressure of serum or pus behind it, abortive measures should be abandoned and speedy and permanent relief secured by the surgical measure already outlined.

After the acute process has subsided you can most generally save the patient from future attacks and thus earn his or his parents' lasting gratitude by advising that his adenoids be removed. You can be sure they are present in fully 90 per cent. of the cases of acute otitis.

CONCLUSIONS.

1. Acute otitis media in children is a common disease. It is sometimes primary but most often secondary to a general affection or to an acute process in the nasopharynx.

2. If the physician keeps in mind its possibility in unexplained febrile affections of childhood and uses sufficient care and patience in the

otoscopic examination the diagnosis is easily made.

3. The treatment is simple and easily applied and if begun early enough and properly used the usual result is excellent.

4. Cases seen late that have been neglected or improperly treated, the result may be a mastoid infection, a meningitis, a brain abscess, a chronic discharging ear or permanent impairment of hearing.

THE CONSERVATION OF HEARING.*

EDWARD E. EDMONDSON, A. B., M. D., C. M.,
MT. VERNON, ILL.

The importance of the function of hearing is so great and its loss is so nearly irremediable that it becomes the first duty of the aurist to acquaint himself with all the elements which enter into the anatomy and physiology of the auditory apparatus and to familiarize himself with the intrinsic and extrinsic enemies of sound conduction and sound perception, to the end that he may preserve the fullest power possible in this field and to be able to use the best means of relieving any disturbance that may arise in this organ at the earliest moment.

There is no more important function in the commercial value of any individual unless it be the eye. When this function is lost in early infancy the result is an added mutism, the little ones not having formed the faculty of speech are unable to acquire it in later life. This fact is forcibly commented on by Gruenwald, who states that in a census in the Kingdom of Prussia taken ten years ago there were 38,000 deaf mutes of which 95 per cent were suffering from preventable deafness, and it is perhaps well within the limits of conservatism to suggest that this same cause is responsible for as great percentage of deafness found in all lands, for we are apparently just entering into the era of conservation of the special senses, and that this study is stimulated to some extent by the commercial necessities of the modern business world.

The acute infections are responsible for the greatest number of cases of deafness, perhaps greater than all other causes combined. Measles, mumps, whooping cough, scarlet fever, diphtheria and influenza seem to be the exciting cause in the vast majority of cases that have come to the notice of statisticians.

To these should be added that large army of persons who are defective in hearing because of causes which result in gradual loss of hearing, and for which the profession has been so long in discovering the etiology.

The elements of audition should be divided into those of the conduction apparatus and the perception apparatus.

The most common causes arise in the conduction apparatus which depends upon the integrity of the ossicles, tympanum and Eustachian tubes; the ossicles for mobility, the tympanum for a normal mucous membrane, and the Eustachian tubes for patency.

Any form of ankylosis of the ossicles creates some loss in the acuity of hearing, the presence of exudates, transudates or infection in the tympanum, or edema in contiguous tissue, or new growths in or adjacent to the tympanum will impair the function, while the patency of the tubes is necessary for the proper aeration of the middle ear as well as affording the proper drainage of the same.

Trauma to the inner ear will produce loss of the function as will infections reaching the perception apparatus through the blood and lymph streams. But for every case of disease of the perception apparatus the aurist meets he will see possibly 100 cases of deafness due to disturbance in the conduction apparatus, and it is to this phase of the etiology that I wish to call your attention in this paper.

To mention the least frequent causes first I should name furunculosis and cerumen in the external auditory canal. I hold in my hand the cerumen and epithelial casts removed from a patient's outer ear which had caused defective hearing for more than 20 years. These were quite easily removed by means of this constant flow pressure syringe, and he became conscious of ordinary sounds instantly.

Of the causes arising in the middle ear the most frequent is a suppurative otitis media, and the next is a so-called catarrhal otitis media.

In all these cases a careful examination will reveal a closure of the Eustachian tube on the affected side. This closure has a cause that should be removed if the aurist would give the

*Read before the Southern Illinois Medical Association, Nov. 6, 1914.

patient permanent relief from impairment of hearing.

The histology of the tube shows that its cartilaginous part is lined on one side with lymphatic glands which are a continuation of the lymphatic or tonsillar ring of the throat, and as such must suffer the same degree of swelling and edema that is seen in infections of the ring in the throat.

Tonsillitis, phlegmon of the pharynx, inflammation of the adenoid tissue all lead to extension of the congestion and edema upward into the fossae of Rosenmueller and from there it is but a step to a serious involvement of the glands of the tube, resulting in its closure with the consequent retention of the products of middle ear metabolism, which in turn form a culture medium for bacterial activity. In mild cases this leads to catarrhal otitis media, which in more virulent infection leads to involvement of the middle ear in an inflammatory process.

In some cases this is of short duration and the throat infection being controlled the ear shares the good fortune of the same and no permanent impairment remains, while in others the ear infection endures long enough to cause thickening of the mucosa and the retention of serofibrinous exudates which clear up slowly or not at all, thus leaving the patient with some permanent impairment of hearing.

This process is repeated with the next infection of the tonsils or pharynx no matter what the character of infection, with still greater loss of hearing and with a more or less chronic catarrh of the tube, leading to defective aeration of the tympanum, and the case becomes one of the partially deaf who are annoyed with missing a word now and then and later with a ringing in the ears that is a still greater impediment to happiness.

In more violent inflammations of the lymphatic tissue of the throat and tube the ear suffers a suppurative process which ruptures the membrane and drains through the external ear or the pus burrows through the aditus ad antrum and a mastoiditis results. Even the perforations may heal and the patient enjoy a certain degree of freedom in hearing, but this should not be expected for it is not the rule. The usual result is a discharging ear that has suffered an impairment of hearing that is not wholly remediable.

This infection of the lymphatic tissues in the throat and tubes follows from the acute infectious diseases and so often we hear the statement that the ears began to run when the patient had the measles or the scarlet fever, or possibly a sore throat.

How then should we endeavor to conserve the function of hearing through the period of childhood when the acute infections are so prevalent?

We are of the opinion that the tonsils serve a purpose in early infancy and that after the age of three years they become functionless and as such are analogous to the thymus gland and should atrophy, but owing to infections gotten from the manner in which civilized nations live the tonsils become infected and the infections remain in the crypts and cause a chronic inflammation of the throat which keeps the tubes in a state of closure.

In infancy the adenoid tissue should be removed if present or if any disturbance with the ears is discoverable.

If the tonsils show hypertrophy or the pillars of the tonsils are red or a pharyngitis is present the tonsils should be enucleated, care being taken that the superior pole is not left after operation. This insures that the most common atrium is removed and there is not so much likelihood of ear infection, and the freedom of the tubes from closure is more probable.

The naso-pharynx should be treated with some reliable antiseptic as iodin-phenol-glycerine on an applicator to remove all bacteria from the entrance to the tubes and then they should be inflated and if there be any further evidence of middle ear involvement, the appropriate vaccine should be used.

In a study of the bacteriology of all the tonsils removed in St. Luke's Hospital, Chicago, it was my observation that all of them were infected with pyogenic organisms, and of this about 2 per cent were tuberculous. A study of the bacteriology of the cases of suppurative otitis media in the same hospital showed the same organisms, and it seems rational to presume that the infection of the oro-pharynx led to an invasion of the tubes and from them to the tympanum and its consequent inflammation.

A clinical study of the gradual loss of hearing in later life shows also a closure of the tubes and retraction of the drum membrane which results

in some degree of ankylosis of the ossicles and a rarification of the air in the tympanum which in itself is an impediment to accurate hearing, for a vacuum is almost a perfect non-conductor of sound waves.

The rationale of treatment in these cases is the same as in the more acute cases, that is to say, removal of the entire tonsil and antiseptic treatment of the naso-pharynx and inflation of the tube.

My best results have been obtained by the following routine: Enucleation of the diseased tonsils, the exhibition of alteratives and a weekly treatment consisting of antiseptic swabbing of the naso-pharynx, inflation of the tubes at the same time using the high-frequency current and vibratory massage to the temporal bone and pneumo-massage directly in the external auditory meatus, and where there remains a discharge from the ear or a posterior pharyngitis the use of graduated doses of autogenous or stock vaccines which clears the ear in from two to eight weeks. The mechanical treatment should be continued till all discomfort is relieved and the tubes stand open without effort.

Where the Gellé test is positive the results may not be so favorable as to the hearing, but the routine treatment gives this class of patients some measure of relief and should be regularly given with this end in view.

The same relief has not obtained in cases where enucleation and vaccines were not used, although there is a marked temporary benefit derived by the rest of the routine treatment.

So far as has come to my knowledge, Dench is the first writer in this country to call attention to the damage done to the function of hearing by presence of chronically enlarged tonsils. He shows very clearly that the enlargement causes a mechanical closure of the tubes.

This results in the gradual deafness of later life many years subsequent to the cessation of acute ear troubles and acute inflammations of the throat and pharynx.

I feel that some emphasis should be placed on the use of the high frequency current and the vibratory and pneumo-massage in these cases, this routine treatment has the effect of stimulating an increase of circulation through the entire auditory apparatus and causes an absorption of the old products of inflammation in the middle ear and gives the ossicles a physiologic action which increases their function and in the structures of the inner ear gives a greater activity to anabolism by which the entire ear is improved and the happiness of the patient greatly enhanced. The operation for removal of the tonsils is of some interest in the conservation of hearing. Any operation which leaves a portion of the tonsil is valueless as an aid to hearing, while any trauma to the pillars as so frequently obtains from the zealous use of the guillotine without first careful dissection of the pillars will lead to a partial removal of the plica and muscle tissue, resulting in scar tissue and contraction which later closes the tubes, thus rendering the operation unsuccessful.

The following cases illustrate the results to be expected in cases of this character:

Case 1. Deaf mute, aged 21 years; suppurative otitis media before the power of speech was formed; otoscopic picture that of completely destroyed conduction apparatus of both ears; repeated attacks of tonsillitis; operated on April 18, 1914, with complete relief of the throat symptoms.

Case 2. Mrs. J. E. R., aged 32 years; gradual loss of hearing dating back 7 years; tonsils enlarged, pillars red, drum membranes retracted; normal conversation negative, as were also the whistles of trains and factories, etc.; tonsils enucleated May 2, 1914, with routine treatment for four weeks, when she passed out of my hands, but at that time could hear the train and factory whistles and the sound of moving trains and loud conversation.

Case 3. W. B., aged 16 years; had suppurative otitis media since two years of age; normal conversation negative; talked in a monotone; tonsils enlarged, pillars red, throat filled with mucus; tonsils removed April 22, 1914, and routine treatment continued for 8 weeks with restoration of power to hear normal conversation and complete relief of the throat symptoms and cessation of the aural discharge.

Case 4. T. A. C., aged 36 years; right ear began running in early boyhood, left ear began to discharge 2½ years ago; normal conversation almost negative; routine treatment relieved temporarily but relapses frequent; removed tonsils June 13, 1914, followed by routine treatments twice a week for 4 weeks with restoration of ability to hear normal conversation and cessation of the discharge.

Case 5. B. W., aged 17 years; complaining of deafness in both ears; normal conversation misunderstood; acute catarrhal otitis media; drum membranes red and bulging; tonsils, pillars and pharynx very red. After controlling the acute inflammation the tonsils were removed June 16, 1914, and followed by routine treatment irregularly for 9 weeks with complete restoration of the function of hearing and cessation of all throat symptoms. It should be mentioned

here that a blood analysis by Dr. W. H. Gilmore showed a hemoglobin percentage of about 70 and with proper treatment at his hands she has improved quite rapidly.

Case 6. J. P., aged 18 years; pain in right ear with loss of hearing following mumps nearly 2 years ago; watch tick negative at one inch; ear drum retracted and malleus foreshortened; tonsils submerged and throat red with some coughing and clearing of the throat; lateral pharyngitis extreme; removed tonsils August 18, 1914, and followed with routine treatment for four weeks with restoration of watch tick at 15 inches and much improvement in hearing and cessation of the pain in the right ear.

Case 7. C. C., aged 17 years; complains of inability to hear normal conversation and of obstruction to nasal respiration; drum membranes retracted and tonsils submerged with red pillars; removed tonsils September 9, 1914, followed with 5 weekly treatments resulting in complete restoration of the power of hearing and cessation of the intumescence of the turbinates.

Case 8. J. H. W., recurrent attacks of deafness in both ears accompanied with some pain; formerly treated by two different "ear men," one removed the nasal septum, leaving a large perforation in the same but obtained no result in the ear condition; the other merely inflated twice a week and attempted pneumomassage with a Politzer bag; patient was prejudiced against the removal of his tonsils and importuned me to give him the routine treatment, which I did twice a week, obtaining temporary results, but with relapses at each new tonsillar infection. The ears showed red membranes and the throat an active tonsil infection and pharyngitis at each "cold" he suffered. When last seen the patient had difficulty in catching the meaning of normal conversation and felt often embarrassed at errors he made in conversation. The prejudice in this case was due to the advice of the "specialist" who made the large perforation in his nose.

Report of the Medical School-Examiner for the City of Rochester, N. Y., for the year 1912:

Total number of pupils examined	47,990
Defects of vision	3,805
Other eye diseases	441
Defects of hearing	340
Discharging ear	135
Defects of nasal breathing	1,982
Hypertrophied Tonsils	6,436
Adenoids	577

This means that one child in ten suffers from eye disturbances while one in five suffer from causes that lead to defects of hearing.

I think that this report shows that our children are more likely to have defective hearing than defective sight and that it is our duty to look well to causes of deafness even in early infancy and to repeat the inspection of the child throughout his school period in order to prevent as far as possible the unfortunate 20 per cent from becoming a burden to themselves and also in some measure to the State.

BIBLIOGRAPHY.

Reik: Diseases of the Ear, Nose and Throat.
Thompson: Diseases of the Nose and Throat.
Phillips: Diseases of the Ear, Nose and Throat.
Kerrison: Diseases of the Ear.
Barnes: The Tonsils.
Blair: Surgery and Diseases of the Mouth and Jaws.
Lockard: Tuberculosis of the Nose and Throat.
Ballenger: Diseases of the Nose, Throat and Ear.
Loeb: Operative Surgery of the Nose, Throat and Ear.
Ashhurst: International Encyclopaedia of Surgery.
Politzer: The Human Ear.
Politzer and Bruehl: Otology.
Dench: Diseases of the Ear.
Wright: Diseases of the Ear, Nose and Throat.
Gruenwald: Diseases of the Mouth, Pharynx and Nose.
Lamb: Examination of the Nose, Throat and Ear.
Pfaundler and Schlossmann: The Diseases of Children, Vols. VI. and VII.

113 South Tenth Street.

DISCUSSION.

Dr. J. T. Whitlock, Mt. Vernon: Those of us who are associated with Dr. Edmondson here know something of his work. He has done excellent things since he has been with us. I want to thank him for his paper; it is a good one.

Dr. A. M. Corwin, Chicago: Dr. Grinstead just asked me to point out these relations from the back of the tongue. Now, we have the lingual tonsil. That is a matter purely for the specialist in our line to handle. It occasionally gives us trouble, gives symptoms that interfere with the comfort of the patient.

Dr. Harry Moss, Albion: Pardon me, Doctor, that lingual tonsil interests me. I have a case just now of chronic cough, referred by me to a specialist, who claims that it is due to enlargement of the lingual tonsil and advises the touching of the lingual tonsil with a five per cent silver nitrate solution every day.

Dr. Corwin: Usually, the five per cent. solution does not do much good in these cases. There should be proper surgical measures taken, or the galvanicautery properly used.

If the patient gags while you are looking into the throat, you will see a bulging that becomes white behind the anterior pillar. You have there what the late Dr. Pyncheon called a submerged tonsil, and it is these crypts which come down in this region which are upright and hold their secretion that do the harm. You cut off part of the tonsil and leave them, and you are going to have trouble there. So the dissection method by whatever means we use, a thorough dissection, without mutilation, is the thing in tonsillectomy. Any tonsillectomy is no light job, it is a hospital job, as Dr. Burkhardt has well said.

We will not discuss the function of the tonsil today; it is their relation to the local, the regional and the systemic symptom complexes that interests general practitioners, surgeons and specialists. When a patient comes to you as a general practitioner, sit down and study that family and get into their confidence, go into the subject of little Mary and John and find out about their throats, their tonsils, etc., and it will have an effect on your practice that will sur-

prise you. You are not taking up something which is not your business, but you are looking ahead before trouble develops; you are using one of the highest privileges of a physician.

Dr. A. C. Housh, East St. Louis: I merely wish to ask for a little information that might be of benefit to the general practitioner, as we all have these cases to do. The question of hemorrhage comes up. Now and again I speak to a man and say, "Do you have any trouble with hemorrhage; that is, when you do a good operation?" "No, that never troubles me," he will say. "I never have any hemorrhage that is alarming." Five or ten months later, or maybe a year or two later, you ask the same question. "Yes," he will tell me, "an alarming hemorrhage from hemophilia," or a tendency to bleed. I have had some trouble along that line, too, where I did not include the anterior pillar.

I used to do these operations in my office and considered them a minor affair. I have quit that. I do no more tonsillectomies in the office. If they cannot go to the hospital, I would rather not touch them. I consider tonsillectomy now a major operation. Now in going over the records and in studying these cases, you will find some of them anemic, the child is droopy, anemic, the blood pressure is low, and I have adopted the routine in these cases of giving them for about three weeks beforehand—that is, where I suspect undue bleeding may take place, or there is a history of some tendency to hemophilia—of giving the thyroid extract, not in large doses, for about three weeks. I also give iron and arsenic, of course, at the same time, as they usually need them, too. Then, about two days before the tonsillectomy I give the calcium chloride in large doses. A child of ten to fifteen years will get forty grains a day for two days. I imagine—maybe I know and I think I do know as far as I am concerned myself, but before these three men of vast experience I won't say I know, but I ask them for information—I imagine this controls to a great extent the hemorrhage in many cases. A number need no preparatory treatment, but I believe this treatment, this calcium chloride especially, is of value. If you overdo it, give it three or four days, I believe you increase the liability to bleeding, but I believe that I have noticed much less bleeding with the employment of this treatment.

Dr. E. E. Edmondson, Mt. Vernon, closing: In reply to the question as to preparation of my patients for operation for removal of the tonsil, there are various methods. Among instruments, the Sluder-Corwin is a good one, the Tydings snare and knives are a good combination. I have had no serious case of hemorrhage, have not had any postoperative hemorrhage. But I might have one next week. But the removal of the tonsil by means of dissection is done in some manner like this: I insert the knife, which is a knife curved on the flat side, cuts on one side only and not on the end, is blunt on the end. I pass this up in the fossa triangularis and turn the end down and do a blunt dissection between the pillars and the tonsil. (With the tonsil on traction?) No, there is no traction used. That is the only instrument in the throat until I reach the base. Then the tonsil is drawn out, and with a small knife, if there are any adhesions, I remove them carefully, then apply the snare or use the Sluder-Corwin instrument. I have both in the office. I have used everything that anybody else has used while senior interne in the Eye, Ear, Nose and Throat Service. Suppose I use the Tydings instrument. I would apply the cold wire snare and work it back deep into the base of the tonsil and enucleate the tonsil by a very slow grip on the instrument. I use in the snare a No. 9 wire. I remove the tonsil gradually, choking the vessels off. As you know, a wagon wheel that runs over a man's leg and crushes it, or a train that runs over it and crushes it, does not produce the hemorrhage that would result if the man had fallen against a saw or had been cut with an axe. The hemorrhage, practically, is controlled by that. With a small piece of cotton or gauze dipped in 95 per cent. alcohol, squeezed out and forced into the fossae of the removed tonsils, and held there for a few minutes, there is very little hemorrhage.

Now, as to the control of hemorrhage, I have found that the prophylaxis is better than a whole lot of the treatment. An ounce of prevention is worth more than a pound of cure. I keep the blood pressure down by forbidding the patient during that day to take anything to eat or drink; I have him remain quiet, see that he does not exercise and by his movements force an increase of blood pressure; and then I have him, when he does take anything, take it in the form of iced tea or iced milk and ice for the first twenty-four hours. While I have not had any trouble, I might have without these precautionary measures. I do not allow the patient to talk, clear his throat, or that sort of thing; in other words, the activity of the throat is stopped. If blood runs down into the pharynx the patient has to let it run; there is not much. The only case of hemorrhage that I have had at all followed an operation done under a local anesthetic, which resulted from a violation of the instructions regarding complete rest of throat and body, and it was almost immediately controlled by ice applied to the throat inside and out.

VINCENT'S ANGINA.

With Report of a Fatality From Gangrene of Throat Following Application of Phenol.

J. Z. Bergeron, M. D.
Chicago, Ill.

Definition: Arrowsmith[1] defines this affection as a "disease characterized by the formation of a membranous exudate on the part involved, and with erosion or ulceration of varying extent in the subjacent tissues; by more or less pronounced

*Read at meeting of North Shore Branch of Chicago Medical Society, Oct. 6, 1914.

implication of the neighboring glands and by constitutional symptoms of irregular severity."

History: Vincent[2] described the disease and its causative organism in 1896, but two years previously (1894) Plaut had also described similar cases and referred to a still earlier work by Miller in 1883. Vincent's subsequent investigations, however, were more thorough and of more value than those of earlier authors, and for this reason the disease is usually given his name, though also known by the name of Plaut-Vincent's angina.

Bacteriology: The causative organisms in this form of angina are a fusiform bacillus and a spirillum. The bacillus is a true anaerobe and will not grow on ordinary culture media, but has been isolated and grown on special media —blood-serum agar and glucose agar. It is from three to four microns in length and from one to three microns in width. From the wide center it tapers gradually to the ends. It is readily stained by methylene-blue and Giemsa's stain and negative to Gram. Some authorities claim that it is motile, others that it is non-motile.

The spirillum is longer than the bacillus and is made up of three to four shallow and irregular undulations, stains with more difficulty than the bacillus and is also negative to Gram. Can be cultivated under anaerobic conditions.

Lasagna[3] has made some experimental researches concerning the bacillus, and his conclusions are instructive. The results of his studies of the bacillus in the one case in which he was successful in isolating it in culture are as follows:

> Injecting the fifteen days culture into animals never produced death, but merely a localized necrosis. I also took sloughing masses from the ulcerated surfaces of the angina, and inoculated them into the mouth and skin of guinea pigs; then I obtained extensive rapid necrosis at the site of injections.
>
> The conclusions drawn by Lasagna from these experiments are that the bacillus lives in symbiosis with other micro-organisms in the microbic ulcer, and together with them determines the initial lesion; after a few days it dominates and sometimes maintains the lesion. Since necrosis can be produced in animals it is evident that in necrotic angina the fusiform bacillus plays the principal part in the development of the disease. But since guinea pigs inoculated with necrotic tissue show more serious and more rapidly developing lesions than those in whom the fusiform bacillus alone was injected, and because in the primary stage of the ulcer Vincent's bacilli are scarce and the other micro-organisms numerous, we must conclude that to the latter are due the initial lesions and the increase in the pathogenic power of the bacillus during the course of the ulceration.

Furthermore, because of the fact that when the bacillus is injected by itself, necrosis is produced, and since in man pharyngeal ulcers assume necrotic characteristics after its appearance, Lasagna concludes that "Vincent's bacillus may be regarded as specific for necrotic angina."

As to the part played by the spirillum and its relation to the bacillus, opinions vary. Halsted[4] writes:

> Since the discovery of Vincent's angina, there has been much difference of opinion among bacteriologists as to whether the specific organisms, the fusiform bacillus and the accompanying spirochete or spirillum were in reality two distinct organisms, living in symbiosis, or simply one, the fusiform bacillus; the spirochete or spirillum being merely evolutionary forms of the former, but always found present with the bacillus.

Vincent and the majority of writers believe them to be two separate organisms. Some recent experiments, however, indicate that the fusiform bacillus is very polymorphous, and that cultures grew "filaments and decidedly spiral forms (Tunnicliff[5]), indicating that the spirillum is only one form in the development of the bacillus. The matter is still under discussion.

Frequency of Occurrence: Reported cases of Vincent's angina are not as common as could be expected. Halsted[4], Holm[6] and others believe, however, that it is not as rare as the reports indicate, and that its apparent rarity is due to faulty diagnosis in cases of pseudo-diphtheria, etc. Halsted points out that this is probably due to the fact that in most cases of suspected diphtheria only the cultures are examined, and as the Vincent bacillus does not grow on ordinary culture media, it naturally is not found by such methods. A direct examination of the smear from the diseased tissues should be made.

Again a failure to find the bacillus may be due to a lack of persistence. If the bacillus is not found at the first examination, repeat the search day after day because the bacilli become more numerous later on in the affection and will be more easily found.

Pathology: The typical lesion of Vincent's angina is a more or less sloughing ulcer covered with a whitish or grayish pseudomembrane, the removal of which reveals a bleeding surface. The

membrane soon reforms. Arrowsmith[1] says that "on casual inspection the membrane resembles very closely that observed in diphtheria. It is of soft consistency and, after a few days, is usually thick, cheesy and friable. At the border of the exudate, which is irregular, there is a zone of redness and edema more or less intense."

Location: Usually the tonsils only (either one or both) are ulcerated, but the ulceration may extend to the soft palate, uvula, pharynx, buccal cavity, and, in the more malignant cases, to the larynx and bronchi.

Clinical Types: Two types of Vincent's angina may be distinguished; a mild form and a malignant form. In the mild form is seen a purely local ulceration, which closely resembles the throat lesions of syphilis. The ulcers, single or multiple, superficial or deep, are covered with a pseudo-membrane and resemble the mucous patch or the tertiary ulcer. They heal by cicatrization. There is considerable pain and foul odor from the breath. The cervical glands may be tender and slightly swollen, but the general health is not much impaired.

In the malignant form, however, the picture is different. In this type the affection closely resembles diphtheria; the ulceration is usually quite extended and often accompanied by general membranous stomatitis. There is a tendency to necrosis with destruction of the parts. There is much pain on swallowing and marked fetor of the breath. While there is only a slight rise in temperature, the pulse is rapid, and prostration and nervous irritability are usually severe. This type may also be a secondary infection to diphtheria, scarlet fever, measles and other infectious diseases. Dr. Leo Green even advances the view that noma or cancrum oris is but an aggravated form of Vincent's angina neglected at its inception.

Diagnosis: The diseases that Vincent's angina more nearly resemble than any other are syphilis and diphtheria; and, while differential symptoms are mentioned as an aid in eliminating the one or the other disease, still a positive diagnosis can only be made by a bacteriological examination of the smear and the finding of the fusiform bacillus associated with spirilla. In this connection must be borne in mind the fact that in the early stages of the disease the bacilli are scarce, but more numerous later on; consequently if the bacilli are not found at first, the search must be continued from day to day, and thus the probabilities of recognizing this affection will be materially increased.

Prognosis and Recurrence: As a rule the prognosis as to recovery is good except in the laryngeal and bronchial types, when death has been known to occur. Recurrences of the infection are reported, consequently one attack does not confer immunity, nor on the other hand has it been shown that one attack predisposes the patient to a second.

Treatment: The treatment consists in local applications, thorough hygiene of the mouth and teeth and treatment to upbuild the general health. Many drugs have been recommended for local application, chiefly iodin, nitrate of silver and potassium chlorate. These are usually combined with some mild antiseptic solution applied with a swab to remove the slough. Richardson[7] uses a 5 per cent solution of nitrate of silver applied daily, and Wherry[8], a 12 per cent solution. Place[9] uses a 2 per cent solution of chromic acid once daily, after swabbing away the slough with hydrogen peroxide. Halsted[4] uses trichloracetic acid every two or three days after preliminary swabbing with hydrogen peroxide, and anesthetizing the ulcer with a 10 per cent cocain solution. Dr. Leo Green[11] paints the surrounding tissues with melted vaselin and cauterizes the ulcer every two or three days with trichloracetic acid in 4 per cent novocain. The mouth is irrigated with 0.5 per cent solution of formaldehyde. Four cases were well in 4 days, two in 6 days and one in 8 days.

French and German physicians have recently employed salvarsan in the treatment of Vincent's angina. Ehrlich uses the intravenous injection method and the French have employed local applications. Dr. Achard[10], in a recent article, reports two cures by the local application of salvarsan first in solution and then in powder. Halsted[4] believes that salvarsan should be tried in cases that do not yield to other treatment. Dr. R. A. Greene[12] recently has reported four cases treated by the intravenous administration of salvarsan in which the throat cleared up in 6 to 7 days.

The following case report is added to illustrate, not so much what should be done as what should not be done.

Case 1. Mrs. W., aged 32 years, first came under a physician's care on May 5, 1912, and on May 9 another physician took charge of the patient because of the first physician's illness. At this time there was very little constitutional disturbance, slight elevation of temperature and general malaise. The throat at the time was very painful, especially when attempting to swallow, and enlargement of the cervical glands was noted. The right tonsil presented a bean sized, rather sharply defined ulcer about the center, the base of which was covered with a rather dirty grayish adherent exudate. The surrounding tissues were acutely inflamed, showing bright angry redness. The physician in charge, thinking he had to deal with a streptococcic angina, prescribed a mixture of hydrogen peroxide, alcohol and water to be used as a gargle once every two hours; the throat was swabbed with 8 per cent argyrol solution every four hours and a gargle of boric acid ordered to be used in the intervals. A cathartic was given and sodium salicylate prescribed, ten grains every four hours. Under the treatment the physician said that the throat showed very little change, and about the sixth or seventh day of his care of the patient (May 15) he began to realize that he was dealing with something more than an ordinary case of ulcerative tonsillitis, and in his eagerness to check the infection, made an application of carbolic acid. Several cultures made from the throat showed no specific organism. May 19 the swelling showed signs of increasing, and a patch appeared on the left tonsil. The original area of infection (on the right tonsil) began to take on a gangrenous appearance, anh the first real putrefactive odor was noticed.

I first saw the patient May 20, at which time she showed general evidence of sepsis; temperature 103; pulse 110; color of skin grayish and facial expression anxious. The right tonsil, uvula and base of the tongue was one gangrenous patch, and there was a small gangrenous area in the soft tissues above the left upper canine tooth. A culture and smear were made and tincture of iodine applied. The results of the bacteriological examination of both the culture and the smear showed the presence of the fusiform bacilli and spirilla.

I did not see the patient again until May 24, when she was sent into the city to be placed in a hospital. At that time a fatal termination seemd inevitable; the gangrenous distribution had progressively extended; temperature was 104.5 and pulse 140. On the next day, May 25, the patient died of general sepsis.

BIBLIOGRAPHY.

1. Arrowsmith, H.: Vincent's Angina, Laryngoscope, 1909, XIX, 340.
2. Vincent, H.: Ann. de l'Inst. Pasteur, XIII, No. 8, 609.
3. Lasagna, F.: Vincent's Fusiform Bacillus: Experimental Researches, Laryngoscope, 1912, XXII, 1009.
4. Halsted, T. H.: Vincent's Angina, Laryngoscope, 1912, XXII, 1372.
5. Tunnicliffe, R.: Fusiform Bacilli and Spirilla, Jour. of Infec. Dis., 1911, VIII, 316.
6. Holm, M. L.: Occurrence of Bacillus Fusiformis in Membranous Affections of the Throat; Vincent's Angina, Jour. of Mich. Med. Soc., 1910, IX, 381.
7. Richardson, C. W.: Vincent's Angina, Annals of Otol. Rhi. & Laryn., 1909, XVIII, 91.
8. Wherry, W. P.: Vincent's Angina: The Invasion of the Tonsil, Laryngoscope, 1911, XXI, 1007.
9. Place, E. H.: Note sur Deux Cas a'Ulcere de Vincent, Bull. et. Mem. Soc. d. Chir. d. Paris, XXXVII, 685.
10. Achard, C.: Salvarsan et l'Angine de Vincent, Bull. d. l'Acad. d. Med., Oct. 8, 1912, XXXIII, 155.
11. Green, Leo: Merck's Archives, August, 1913.
12. Greene, R. A.: Northwest Med., February, 1914.

INDIGESTION.*

E. O. Laughlin, M. D.,
PARIS, ILL.

The subject of disease of the digestive tract is becoming a hackneyed one in this society, and as an excuse for opening the subject again today, I am going to present some statistics.

In looking over my records I have chosen at random the diagnoses of cases coming under my notice for one average week, excluding those of a surgical nature. I happened to take them from a week in October when there was very little acute illness and they represent mostly office cases, but I think they are fairly typical of the average practitioner's ordinary routine experience.

The list includes one case each of locomotor ataxia, chronic interstitial nephritis, diabetes mellitus, diabetes insipidus, malaria, senile dementia, cold and goitre; two each of bronchitis, tonsillitis, intercostal neuralgia and cystitis; three of rheumatism and three of arteriosclerosis, of which one has marked digestive disturbance; four of pulmonary tuberculosis, all with bad digestion. Of the rest all represent or are accompanied by diseases of the alimentary canal. Tabulating these I find one case of simple diarrhea, three of neurasthenia with marked gastric and intestinal distress; one of migraine, probably of toxic origin; one of epilepsy, which I think due to chronic auto-intoxication; five of biliousness—not a scientific but a very satisfactory diagnosis—four of acute indigestion; and eighteen of chronic gastric or intestinal indigestion.

Thus I find that 57 per cent. of all cases presenting themselves during the week were suffering from some form of indigestion.

Of the eighteen chronic cases one had symptoms of gallstones and one of gastric ulcer; four presented evidence f intestinal fermentation, due to constipation and stasis. The remaining dozen cases belonged to the common category of dyspepsia, ranging from slight distress, flatulence

*Read before Edgar County Medical Society, Nov. 18, 1914.

and palpitation after eating, to acute pain, nausea and general malaise.

In our older textbooks we were taught to classify our chronic gastric cases as atonic dyspepsia, in which motility is decreased and the secretions diminished; chronic gastritis, with pain, vomiting and catarrhal symptoms; hyperacidity of the stomach; ulcer and cancer.

Nervous dyspepsia was to be treated with stomachic tonics, pepsin and hydrochloric acid; gastric catarrh with astringents, sedatives and lavage; hyperacidity with alkalies, etc.; while intestinal fermentation required cathartics and antiseptics. At the same time great stress was laid upon diet.

Clinically we do not always find the lines distinctly drawn among these various types of trouble. What was termed atonic hyspepsia we find frequently due to disease in some remote organ. Hyperacidity is usually of nervous origin, while intestinal fermentation is very commonly due to some mechanical interference or displacement of the bowel.

Neither do we find the symptomatic treatment, outlined in the books, always satisfactory. Personally I have seen very few patients benefited by any preparation or dose of pepsin, and I doubt the advisability of administering hydrochloric acid for any long period of time. Among stomachics I have found hydrastis and nux vomica of value; most others inefficient and inferior.

Back of every case of disease of the digestive system is a cause. This cause is either nervous, mechanical or bacteriological. In the nervous group I include all so-called sympathetic cases, in which digestion is disturbed by direct irritation of sympathetic nerves or by the depressing influence of toxines; also that numerous class of cases in which worry and imagination play an important role. As mechanical I class those due to faulty habits of eating too rapidly and too much; also those cases due to visceroptosis. I have some doubt as to whether the bacteriological class exists at all, as a fundamental class. No doubt the fermentation in these cases is due to the action of bacteria, but why the intestinal bacteria should be overactive in one patient and not in another of similar habit needs explanation.

I am convinced that stasis is the principal causative factor in most cases of intestinal fermentation; that the lack of efficient peristalsis permits the food to remain in the bowel too long, thus prolonging the natural fermentative process beyond physiological into pathological bounds. Many gastric cases, too, are, I believe, produced by delayed peristalsis. Not long ago a middle-aged woman of robust build presented herself to me with the single symptom of distress in the stomach at night. This condition often lasted until nearly morning, when she was conscious of the stomach emptying its contents into the duodenum, and thereafter felt relief. Examination revealed a slight downward and forward displacement of the hepatic flexure of the colon and a somewhat dilated stomach. She was placed in the Trendelenburg position, the abdominal contents forced upward and adhesive strips applied. A week later she reported that she had been promptly and completely relieved of all symptoms. How permanent the result will be remains to be seen, but I think her immediate relief proves that her trouble is mechanical.

Most cases of enteroptosis are doubtless surgical in their nature and can be completely cured by operation only, but many of them can be greatly alleviated by suitable abdominal support and medication. There is a class of these cases, not of congenital origin, in which a loss of tonicity and decrease of intra-abdominal fat seem to be the chief factors. These patients are usually women past middle life, with flabby, pendulous abdomens, anemic and below par generally. Besides abdominal distress, they often suffer from some degree of hyperacidity of the stomach. These patients are benefited by measures which delay fermentation and promote peristalsis, such as the administration of salol, the sulphocarbolates and cultures of the Bulgarian bacillus, and paraffine oil, mineral waters and the like. If to such medication we add an efficient mechanical support to the prolapsed viscera complete restoration to health often results.

Diet is an important element in the treatment of all digestive disturbances, yet I am inclined to think the matter of dieting our dyspeptics is often overdone. Most of them come to us eating too much or too little. More often the adjustment of diet should be quantitative than qualitative. Neurasthenics have often excluded this article of food and that from their diet, until, like the traditional farmer's horse, they are trying to

live upon a straw a day. They should be put upon a liberal and well balanced ration and encouraged to forget their stomachs.

Cases of true gastritis and ulcers, of course, require strict dieting. In such cases the diet should be rigidly enforced until relief is obtained and then a full diet should be insisted upon.

The main point in the handling of the multiform phases of indigestion is to be thorough in examination. Subjective symptoms are often similar in cases which differ greatly in etiology.

In all chronic forms of trouble, the patient's abdomen should be bared and the various organs examined carefully. The size and position of the stomach should be outlined by percussion; the liver and gall bladder should be investigated; also the appendix; and an effort made to outline the position of the colon. Inspection alone will often reveal a sunken area just below the epigastrium, with a visibly pulsating aorta—a condition almost pathognomonic of coloptosis.

When the relations and condition of all the adjacent organs are found to be normal, the stomach, itself may be considered primarily at fault. Excluding ulcer and cancer, the purely gastric disturbance will usually be found to be a condition of hyperacidity or catarrh. The stomach tube will sometimes be needed for the final test. Large quantities of mucus mean catarrhal gastritis. Lavage with a solution of bicarbonate of soda will generally relieve it. Hyperacidity is often sufficiently evident from the symptoms of burning, sour eructations, etc. If not, a test meal and analysis will make the diagnosis plain.

Functional hyperacidity often accompanies a condition of so-called acidemia; and besides the gastric discomfort these cases frequently complain of irritable bladder, stomatitis and aches and pains throughout the body.

For this condition, I have found a combination of magnesia and hydrastis very serviceable.

In conclusion: If we can successfully combat the protean forms of indigestion, we can not only add to the comfort and usefulness of our patients, but protect them against all forms of infectious diseases and forestall the eventual development of nephritis, arteriosclerosis and other results of autointoxication.

Equipped with a healthy alimentary canal, a man can defy three-fourths of the maladies to which human flesh is heir—even old age, itself, may be indefinitely postponed by a sound digestion.

COLIPYELITIS.*

B. G. R. Williams, M. D.,
PARIS, ILL.

Pathologically considered the bladder is to the urinary tract what the stomach is to the alimentary tract. Primary gastritis is rarely met; the same holds true with primary cystitis. Practically always bladder symptoms are secondary to other lesion. In alkaline cystitis we have to deal with stone, tumor, enlarged prostate or other mechanical condition resulting in stasis of the urine, its decomposition and so on. So-called "acid cystitis" in ninety-nine cases out of the hundred, is not a cystitis but a "scalding" of the vesicle mucosa or reflex phenomenon, the lesion in either case being higher up. Such is the case with renal phthisis. The same may be said of most infections by the colon bacillus. Within the past year alone I have come into contact with over sixty cases where it was definitely proven that the colon bacillus was the criminal, and the following observations have suggested themselves for practical consideration:

Etiology: Colipyelitis is essentially a disease of females. Now and then a male is affected, but for some unknown reason the weaker sex is more prone to the disease. Age counts for something. The disease is more frequent in young women and often occurs in female babies. It is especially frequent in young married women especially if pregnancy is delayed. It is worse in severity as a rule near the catamenial period and often disappears with the next conception. Among predisposing factors may be mentioned physical overtaxation in a young woman. In one case raking the leaves off a yard, in another a big washing appeared to be directly responsible. The disease is likely to follow typhoid. I noted in one neighborhood four cases at the same time in adjoining houses. Season appears to have but little bearing on the etiology. The specific virus is a member of the colon-typhoid group of bacilli but more nearly related to the *B. coli communis*, the natural inhabitant of the bowel.

*Read before Edgar County Medical Society, Nov. 18, 1914.

If identical, through some peculiar exaltation it has acquired pathogenic qualities.

Pathology: Colon infections are often considered "fecal infections." As a matter of fact the colon bacillus may have yielded many of those properties which it possessed as a saprophyte. In closed abscesses a very marked fetor not unlike fecal gas may develop, and the pus may be brown and like syrup. But in colipyelitis an odor is rarely detected. A few years ago we thought that infection occurred between the anus and the meatus urinarius, and that this infection was ascending. Now we know that these infections are usually hematogenous. They are always hematogenous, of course, where colipyelitis or colon perirenal abscess follow colon bacillus skin abscesses. We know that over 75 per cent. of all bacteria in the stools are dead and the rest perhaps attenuated and hence comparatively harmless. Moreover colon infections of the urinary tract are not especially frequent in the puerperium; all of these facts pointing rather to hematogenous infection.

We are likely to find in these urines pus, high acids and specific rods. The second find is invariably present at all times. Either or both of the others are present at times. In one case referred by Dr. A. clumps of rods and high acids appeared several days before the pus. In fact the diagnosis was made before a single cell was found. These came suddenly and clouded the urine within an hour or so. In another case referred by Dr. C. the pus appeared with the symptoms but the rods could not be found and renal tuberculosis was suspected. In three days the pus had decreased in amount but in the fresh urine the clumps of bacilli were so thick that macroscopically they made up almost half of the sedimented urine. I might state here that in the female where vaginal contamination is suspected it is neither necessary nor desirable to catheterize. Collect rather in several sterile glasses. If a pyelitis the last urine and middle urine should both contain the pathological debris.

In relapses any of the three finds may recur. High acid always is noted. Pus or rods but rarely both, may be absent.

It is unnecessary to go into laboratory identification methods. Every bacilluria is not a colon bacilluria, and great pains need often be taken to rule out a typhoid bacilluria. Fresh specimens are always collected under strictly aseptic conditions.

Symptoms: These are of three classes from which there may be any mixture. In some patients there may be an alternation of these classes:

1. Lumbar or abdominal distress usually unilateral. May be no pain but merely a tenderness over kidney.

2. Bladder symptoms, irritation, frequent urination, etc. This is essentially a reflex phenomenon or else the urine "scalds" the bladder mucosa. The lesion is higher up invariably.

3. Chills and fever with accompanying symptoms of headache, etc. Chills may be absent and I could point out several cases in which typhoid was diagnosed until the other symptoms or chills gave the clew. As I have stated above the infection may follow true typhoid. It occurs during convalescence and may be initiated by chills and fever. Other symptoms may be absent. Always examine the urine. Fever in baby girls is suspicious. Be loath to diagnosticate typhoid without extended urinalyses.

Prognosis: We shall mention complications below. Colipyelitis sometimes slays. As a rule it is not dangerous to the patient if properly combatted. With serious symptoms the patient may put on flesh. It shows a tendency to hang on or recur. For this reason after the cure appears to be cinched, a course of treatment should be taken every few months.

Diagnosis: The proper path is self-evident. Because stone, tuberculosis, etc., may give similar symptoms these are sometimes suspected. Proper urinalyses will quickly rule them out. In at least three cases, because of the chills, gall bladder infection had been suspected. Typhoid fever is the stupid conclusion arrived at by one who neglects or belittles laboratory aids. I have seen at least two physicians eat dirt for this very mistake. I shall cite a case in conclusion (see below) where appendicitis was suggested.

Treatment: Known the habits of the colon bacillus he can be conquered with ease. It is a habit in considering the treatment of almost any disease to note the value of rest. But there are three diseases where the value of rest should be emphasized: Gonorrhea, hyperthyroidism and colon infections of the kidney pelvis. Even as

overexertion has been noted as a predisposing factor in the etiology, so may rest be accepted as a valuable therapeutic procedure. Just as long as the young lady teacher persists in standing on her feet, just as long as the housewife continues to sweep, scrub and iron; just as long as the high school girl continues to attend several dances a week; just that long can you promise her no relief. Concerning drugs, three lines of treatment are advised. First of these is the alkaline treatment. Do not be afraid to give large doses else you will aggravate rather than check the disease. Ofttimes the acidity is tremendous. Grow the colon bacillus on litmus-glucose-agar if you doubt his acid elaborating qualities. Test the urine frequently and keep the reaction distinctly alkaline. Then we have the urotropin method of treating all infections of the urinary tract. Give 15 grains three times a day for several days. Rest a couple of days and repeat the dosage. Most physicians give but 5 grain doses, but did you know that it has been shown that 5 grain doses will not liberate formaldehyde into the urine? Better give none. The third method which I will suggest is the alternate treatment. This I devised several months ago and have recommended it to the attending physician where I have been called as consultant. For three days the alkaline treatment is pushed. For the next three days the urotropin treatment is pushed. The next three days pass without treatment and then the process is repeated. The colon bacillus will soon run up the white flag. It may interest you how I devised this treatment. Finding a colon infection in the urine I would say, "Doctor, why don't you try urotropin?"

"That is just what I have been doing."

"In large dosage?"

"Yes, indeed!"

In such case I would advise the alkaline treatment as a substitute. I found that cases where the alkaline treatment had failed yielded soon to the urotropin and vice versa. Some of you may wonder why I did not advise a mixed treatment. I will tell you. The urine must be acid for the formaldehyde to be liberated from the urotropin.

I hear you suggest the vaccine treatment? This is worthless. Else there would be no colon infections of the urinary tract. The colon bacillus (hence his vaccines) are part of the human anatomy. He enters the colon of the babe and takes up a permanent residence a few hours after birth. The colon bacillus of the colon infections gains new properties to be pathogenic. Raise him on artificial media and he loses these very properties. Colon vaccines are worthless, therefore, from a theoretical standpoint. A few trials will convince you of their clinical shortcomings.

Complications: Colipyelitis is often a complication of abscesses (especially ischiorectal), appendicitis, typhoid fever, etc. Upon the other hand there are few complications of colipyelitis. Renal tuberculosis has been suggested. In some cases tuberculosis appears to have succeeded colon infection, but as a rule the infection was tuberculous at the onset. Careful urinalyses, haemanalyses and studies of symptoms would have demonstrated this.

Conclusions: In conclusion I desire to present one especially interesting case of colipyelitis showing the value of history records. It will be especially interesting to begin at the last and work backward. A woman takes suddenly ill with vomiting, pain in the right flank, leukocytosis, slight fever, increased pulse frequency and other features pointing conclusively to appendicitis. Wait. Inquiry reveals a peculiar history extending many months back. At every catamenial period she suffers from "bladder symptoms." A few hours later the "appendicitis" ends by a flow of pus, colon bacilli and excessive acids in the urine.

Let us go back a bit further. Two years preceding this woman had a severe chill followed by abdominal distress, bladder symptoms and other features typical of a colipyelitis.

Let us go back a bit further. Two years before this time the woman had been afflicted with a series of six severe ishiorectal abscesses. The last of these when opened loosed a brownish thick pus with the most horrible odor which could be imagined. Now it is easy to follow the case in the forward direction, especially so when we recall the surgical advice proposed many years before the existence of colon infections was known: "Infections of the kidney are likely to follow certain cutaneous abscesses, especially certain ischiorectal abscesses."

THE RELATION OF TRAUMA TO APPENDICITIS.*

CHAUNCEY SHERRICK, M. D.,
MONMOUTH, ILL.

This paper is prepared for the purpose of describing three cases of appendicitis with a distinct traumatic history, with some reference to literature bearing on the subject.

The naturally protected position of the appendix, lying as it does against the posterior abdominal wall, and covered by intestines, would seem at first sight to render impossible any injury from direct trauma, unless of the most severe character. There is abundant evidence, however, to the contrary, and the medico-legal complications which may arise in cases of appendicitis, occasioned by such common and apparently trivial injuries as a blow, a kick, a contusion, or even a violent strain, are numerous and interesting. From this standpoint traumatic appendicitis becomes of importance to the physician.

Case 1. A young man, plowing in a field full of stumps, received a severe blow in the right side of the abdomen by the handle of the plow. This injury was immediately followed by severe pain, although he was not confined to bed until the following day. The ordinary symptoms of appendicitis followed and he died on the fifth day, operation having been refused. The autopsy showed peritonitis, a perforated appendix with a concretion lying in the perforation. No history of previous attacks could be obtained, but the post mortem findings clearly showed the existence of pathology previous to the injury.

Case 2. A traveling salesman, by the derailment of an interurban car, was thrown violently against the back of the seat in front of him, his abdomen receiving the chief impact of the blow. The severe pain felt at first soon disappeared, but returned again a few hours later with all the symptoms of appendicitis. Operation revealed a perforated, gangrenous appendix. In this case a history of two preceding attacks was obtained. I was interested to note that the interurban company settled with him promptly as a personal injury case, and his accident company paid his claim in full.

Case 3. I saw by the courtesy of Dr. McCoy, of this city, a boy, aged six years, who was struck in the abdomen by the elbow of his older brother, while in some sort of rough play. He immediately complained of severe abdominal pain, which continued with vomiting and the ordinary symptoms. He was not seen by a physician for three days, and was then immediately operated on. A peritonitis was found, a red, thickened, perforated appendix, the mucous membrane of which was gangrenous, while corresponding to the perforation there was a firm, oval calculus, as large as an orange seed. Recovery took place.

My personal interest in traumatic appendicitis was aroused by the first related case, which occurred in 1887, and at that time I should have hesitated very much if I had been asked before a coroner's jury to state if an injury could be the direct cause of appendicitis. At that date our knowledge of such cases was very imperfect. At the present time I could assert with a clear conscience that there might be a distinct demonstrable connection between the lesion found in the appendix, the manifest cause of death, and the injury which preceded it.

Careful history taking will demonstrate that the number of cases in which appendicitis is associated with injury is much greater than is usually credited, but the analysis of these cases will show in a large per cent previous attacks or prominent symptoms also can be demonstrated. In addition, we all know that foreign bodies, fecal concretions, strictures of the appendix, adhesions, etc., are frequently present without having caused any symptoms or suggestion of any trouble in the right iliac fossa. It can readily be seen how such conditions would lead to error in cases in which a history of a previous attack was not obtainable, and in which an acute attack supervened upon an injury. On the other hand, it is a curious fact that patients are prone to account for tumors, especially in the breast or abdomen, by a fall, or a strain, but in acute abdominal conditions, beginning with colic, the attention is turned in an entirely different direction, and an indiscretion in diet is their first thought when asking an explanation of their malady.

W. B. Small, of Lewiston, Maine, writing on this subject says: "I believe the true cause of the large per cent of cases of appendicitis in young men is found in the more frequent exposure to accidental injuries and strains, and to the strong contractions of the abdominal muscles necessary in their work. This brings the subject into prominence from a medico-legal point of view." He believes that accident insurance companies, or corporations, or individuals responsible for the results of accidents are as plainly liable in these cases as for a broken leg. He collected fifteen cases occasioned by trauma.

*Read before the Warren County Medical Society, Nov. 6, 1914.

Howard A. Kelly, in 1905, presents fifty cases of appendicitis collected from literature, which he considered due to previous injury. In some of the cases which he described, the duration of time between the reception of the injury and the onset of the appendicitis was so great, and the connection appeared so remote, that it was hard to agree with the author that these cases were those of true traumatic appendicitis. It is interesting to note in this connection that Kelly, writing with Noble in 1908, appears to have modified his views and now says that "trauma, especially a direct injury, is a somewhat frequent cause of an acute attack of appendicitis, when previous disease has existed. It has not been proven that trauma ever caused inflammation in a previously healthy appendix."

A most extensive study of the literature has been made by Deaver, and he has been able to collect 150 cases. He states that the writers produce no evidence to prove whether the injury actually preceded an attack of appendicitis in a healthy organ, or merely was the exciting cause of an acute attack in an appendix already diseased. In all cases reported in the literature, it is probable that the appendix was already diseased, and a careful study of these cases in detail will show that in a large percentage there is evidence to show that previous pathological changes had occurred in the appendix that were not recorded in the histories, or were shown to be present by an examination of the changes found in and about the appendix at operation or autopsy. He states that he personally never has seen a case of acute appendicitis occur in which injury was alleged to be the direct exciting cause in an appendix that did not show evidence of pre-existing disease. Similar statements are made by Fowler, Walker, Jungst, Schroth, Nothnagel, Anglade and others.

An appendix, bound down by adhesions from previous disease, or containing fecal concretions, or having other pathological conditions, may, as a result of blows on the abdomen or violent muscular action, be so far disturbed that an acute condition may be excited.

This question whether the appendix was normal at the time of the injury is of very great importance, for if the appendix was diseased, and therefore liable to an outbreak of inflammation under slight provocation, the status of the defendant in a damage suit is manifestly improved by this fact.

It is the opinion of Jeanbran and Anglade that an attack of appendicitis which comes on later than two days after the traumatism, cannot be assigned to the injury as its cause, and if the patient recovers from the immediate effect of this traumatism, and inflammation involving the appendix should subsequently follow, it could not properly be attributed to the injury.

As a rule in a case of traumatic appendicitis there can be no allegation of negligence on the part of the plaintiff in bringing about or aggravating his condition, since he must have been entirely unaware of his condition until it was revealed by the surgeon's knife. On the other hand, it cannot be said that the acute attack would have occurred independent of the injury inflicted by the defendant, who becomes, therefore, liable for lighting the disease into activity.

In order to determine the degree of responsibility of the defendant it will be necessary to show how much violence was used, and to associate this factor with the previous condition of the appendix as revealed at operation or post mortem. In view of the grave consequences to the defendant involved in an action for damages, the physician who examines the appendix and surrounding tissues in any case with a traumatic history, ought to note carefully the presence or absence of any old adhesions or peritonitis, of rupture or perforation, of acute strangulation of the appendix. If it contains a large concretion, or if the patient has had previous attacks, and it can be shown that but slight violence was suffered, and that without intent to do injury, the status of the defendant will be that far improved.

When we consider the thoroughness with which Deaver has reviewed the literature on the subject of traumatic appendicitis, and realize that his large personal experience places him in a position to speak unquestionable authority, his conclusion can well be accepted in every particular. These conclusions in all essential details are hereby quoted.

1. From his personal experience, and from a study of the literature, trauma cannot be considered as ever being the direct exciting cause in a perfectly normal appendix.

2. An acute attack of appendicitis can follow a severe blow upon the abdomen, or be due to severe muscular strain, but in this case the appendix will be found to present evidence of some pre-existing pathological condition.

3. Acute traumatic appendicitis is observed most frequently in males on account of a more active life, and greater liability to strains and injuries, and between the ages of 10 and 25.

4. In an appendix previously diseased the liability to an acute attack supervening upon injury is in direct ratio to the degree of injury, and depends entirely upon the pathological changes in the appendix at the time of injury.

5. The mortality is very high in these cases on account of failure to recognize the condition until the disease is well advanced, the rapid gangrene and perforation which occurs, and the delay in operation.

6. When the history of a case is suggestive of traumatic origin, careful notes should be taken relative to the cause of the injury, and if operation ensues, a record should be kept of the pathological findings.

I hope that enough has been said to demonstrate that such a condition as traumatic appendicitis can exist, but that great care should be used in making such a diagnosis in view of the medico-legal complications which may result.

Good air has never done any one harm. The same cannot be said of bad air. Why then breathe bad air, when good air, as a rule, is easily obtainable?

Tuberculosis is the commonest of all diseases and by many people is still regarded as incurable. This idea is all wrong. Dr. Edward Cummings in the *Journal of the Outdoor Life* says:

"Tuberculosis is a curable disease. We cannot lay too much stress on this fact, we cannot publish it too often, because there are many people who still think that consumption is always fatal. This is because the general public gets all of its strong impressions of the disease only from far advanced and fatal cases. People do not hear much or think much about the cases that get well."

The great, big, important thing is the right kind of treatment at the earliest possible stage of the disease.

NEGRO DEATH RATES.

A study of the death rates of the negro, shown in the accompanying table, as compared with those of the white portion of Chicago's population, gives rise to some interesting conjecture as to the need for public education among the colored people now living in Chicago.

Since 1910 this portion of our population has increased from 44,306 to 47,279, with a corresponding rise in the death rate from all causes.

The average scale of wages among the negroes is low. Consequently, he is forced to live in dwellings which are oftentimes insanitary and unfit in every way. He is often poorly educated; needless to say, sometimes in complete ignorance of those things which contribute to public health. These factors, together with a possible racial susceptibility to some forms of disease, may account for the high death rate in tuberculosis, which is three and one-third times as great among the colored people as among the white. Also, in pneumonia, a dirty-air disease, the rate is 371.7 per 100,000 of population, as compared with 237.9 among the white people.

On the other hand, however, the negro appears to be practically immune to scarlet fever and diphtheria, the rate being 2.1 and 10.7, as against 18.8 and 38.0, respectively, among the white race, for these diseases.

Typhoid fever, a disease whose prevalence, it is almost needless to say, is amenable to proper sanitary precautions, shows for the negro a death rate of 23.6 and for the white a death rate of 13.4.

Death Rates of Negro and Total Population, 1910, 1912 and 1913.

COLORED.

	1910	1912	1913
Population	44,306	46,284	47,279
Deaths	1,075	1,211	1,175
Rate per 1,000	24.26	26.16	24.85

TOTAL POPULATION.

	1910	1912	1913
Population	2,195,551	2,294,711	2,344,018
Deaths	33,241	33,998	35,291
Rate per 1,000	15.14	14.68	15.05

Death Rates Chicago, 1910, Per 100,000 Population, U. S. Census.

	White	Colored
All causes	1495.1	2387.3
Typhoid fever	13.4	23.6
Scarlet fever	18.8	2.1
Diphtheria and croup	38.0	10.7
Tuberculosis of lungs	150.8	502.8
Other tuberculosis	9.0	36.5
Heart disease	130.7	285.8
Pneumonia	237.9	371.7
Bright's disease	111.8	208.4

And so on, the death rate for the negro is considerably higher in the majority of diseases, as compared with the entire population of Chicago, and compared with the white portion, is still more unfavorable.

—*Bulletin Chicago Department of Health.*

ILLINOIS MEDICAL JOURNAL

Published monthly by The Illinois State Medical Society, under the direction of the Publication Committee of the Council.

GENERAL OFFICERS 1914-15

PRESIDENT.....ALBERT L. BRITTIN, Athens
PRESIDENT-ELECT.....CHARLES W. LILLIE, E. St. Louis
FIRST VICE-PRESIDENT.....OTTO T. FREER, Chicago
SECOND VICE-PRESIDENT.....EVERETT J. BROWN, Decatur
TREASURER.....A. J. MARKLEY, Belvidere
SECRETARY.....W. H. GILMORE, Mt. Vernon
(Ex-officio Clerk of the Council)

THE COUNCIL

District 1—EMIL WINDMUELLER, Woodstock.
District 2—EDWIN S. GILLESPIE, Wenona.
District 3—CLYDE D. PENCE, Chicago.
District 4—AUGUST H. ARP, Moline.
District 5—C. S. NELSON, Springfield.
District 6—C. D. CENTER, Quincy.
District 7—C. F. BURKHARDT, Effingham.
District 8—E. B. COOLEY, Danville.
District 9—FRANK C. SIBLEY, Carmi.

CLYDE D. PENCE, *Chairman*, 3338 Ogden Avenue.

Send original articles and all communications relating to advertisements and mailing list to Dr. Clyde D. Pence, Editor, 3338 Ogden Avenue.

Membership correspondence to Dr. W. H. Gilmore, Mt. Vernon, Ill.

Society proceedings and news items to Dr. Henry G. Ohls, *Managing Editor*, 927 Lawrence Avenue, Chicago.

FEBRUARY, 1915.

Editorials

TWILIGHT SLEEP.

In reviewing both the medical and lay literature of the last three months, it is at once noticed that a large amount of space is given to the above title. Soon we forget the tuberculosis cure of Friedmann or the discovery of the north pole.

Since midwifery has been taught as a science every effort has been made to reduce to the minimum the attending pains of labor, and it is rarely that we now find an obstetrician who does not use anesthetics in the practice of his art. Just so soon as a new anesthetic or anodyne is found, it is tried—as it should be—for the relief of labor pains.

A number of years ago scopolamin was highly recommended for this purpose. It was used with morphin, hyoscin, atropin, cactin, and other drugs of like character—with various results—depending much upon the enthusiasm of the attending doctor. This treatment was heralded from one end of the country to the other, but not with the same zeal as is done in the present wave of enthusiasm. After awhile the use of these drugs for obstetrical purposes diminished with about the same rapidity with which they were so widely used.

The legitimate use, when indicated, of scopolamin-morphin anesthesias, spinal anesthesias and nerve blocking anesthesias, are each a distinct advance in surgical procedure, and will, no doubt, reduce the dangers and mortalities of surgery.

That scopolamin and allied drugs, including morphin, are excellent therapeutic agents in obstetrical practice, when used with intelligence, few will dispute. To use any of them in a routine way cannot but produce harm. After awhile, when experience has taught the facts as well as faults in this medication, these drugs will find the right place in the doctor's armamentarium, and we suspect it will prove to be a very useful agent for selected cases.

Under the present agitation, it is deplorable that a number of our American doctors are seeing fit to take advantage of newspaper publicity for the purpose of self-advertising. It is not pleasing to the profession to have these questions thrashed out in the daily press or monthly literary periodicals; neither is it pleasing to the profession to see the pictures and life histories of its members, together with clinic citations, spread on a page of a Sunday newspaper. Those who are guilty of such conduct are no better than, and should be placed on the same plane of respect as Lydia Pinkham. Still a far graver condition or danger will arise from this newspaper publicity. The number of morphin subjects among women will increase in proportion to the amount of newspaper publicity that is given this treatment, and this will tend eventually to condemn a drug that might otherwise be very useful to suffering womankind.

FOOT AND MOUTH DISEASE.

The people of Illinois are much interested in and quite likely to be much affected by the present epidemic of foot and mouth disease in the herds of this state.

Fortunately up to date there has been very little or no human infection.

At the present time there is much friction existing between the government and state officers, the state judiciary and the owners of dairy herds. This condition of affairs is keeping all

concerned in a state of anxiety, and is not helping to cut short the epidemic. It brings out the fact very plainly that all are working in the dark and that those in authority are not accomplishing all that could be desired.

The infection has appeared in 51 counties in Illinois, 9 counties in Wisconsin, 16 counties in Michigan and 18 counties in Indiana. Other states are just as badly infected. In Illinois approximately 575 farms have been infected and 538 herds have been slaughtered. These herds consisted approximately of 18,496 cattle, 23,268 hogs and 524 sheep, with an appraised value of $1,252,651.97. The real value, of course, is much above this figure.

In Wisconsin 36 herds have been infected, 95 herds in Indiana and about 235 farms in Michigan.

According to the literature, there has been some human infection in European countries with no great mortality. Just what the mortality has been we do not know, but it is quite low and practically limited to infants. Whether or not the mortality rate is high, none of us cares to come in contact with the disease. Germany seems to be more affected than any other European countries, and statistics from the outbreaks there indicate the enormous commercial and economic loss.

The outbreak, which appeared in Germany in 1888, reached its height in 1892, when 1,304,299 cattle, 2,193,187 sheep and 4,238,262 hogs were affected with the disease. It gradually diminished after this time, but again reached very great proportions in 1899 when 1,885,774 cattle, 1,505,830 sheep, 814,862 hogs were affected. After that time the disease gradually diminished, although it continued to exist to a greater or less extent. In 1910 it appeared to gain in virulence, and in 1911 the affection was more widely spread than ever before in the history of that country. In that year 3,366,369 cattle, 1,602,627 sheep, 53,674 goats and 2,555,374 hogs were affected with the disease.

England has had more success in stamping out the disease than any other countries, but did it by a strict exclusion of cattle from the country.

The mortality in animals infected is very low and almost limited to young calves. In one of the early epidemics in Germany, out of 700,000 infected cattle, the mortality was 1 per cent. In the Wuertemberg epidemic of 1872 out of 50,000 infected animals there was a mortality of 3 per cent. Of course, in a highly malignant form, the mortality has been known to be higher. In the present epidemic the mortality owing to the disease is nil. In view of these facts, it is highly questionable whether slaughter of all animals on infected farms is justifiable, when one considers the immense economic loss to the country of such procedure and the uncertainty of the results, even under such radical measures.

Whatever the solution may be for the eradication of the disease, we certainly think our government officials have been very slow in viewing the importance of a violent outbreak. In each of our three previous epidemics the disease was traced to imported cattle, and in this instance the trouble is assigned to imported hides. We do not know if this is true, but the presumption is that it is correct. To have held the few head of imported cattle which this country received from European countries in strict quarantine a sufficient time to be absolutely positive concerning their health conditions, would have been trivial and of comparatively little expense, yet the government has permitted the three outbreaks from the same sources, and the *fourth* from a closely allied cause, thus jeopardizing the stock industry of the entire country, and also the health and welfare of the people.

How many more epidemics will be necessary to awaken the government to the danger of importation? The dissension now is about the method of eradication of the disease. The government and the state veterinarians want to slaughter and bury all animals found on a farm and subject to the disease as soon as a case is discovered. This may be the correct procedure —probably is—but more than three months' trial has evidently not demonstrated it to the satisfaction of all concerned; in fact, the method at present does not seem to have gained us very much, possibly because of intervention and hiding of the disease. Less opposition to any method of eradication would be encountered if the government would bear more of the burden and do it without such delay. There seems to be no good reason why the carcasses and hides of animals not infected should be sacrificed under government or state inspection. This economic loss should be avoided, and thus help the owner to

a considerable extent; but the government officials seem not to be able to see such small economies, neither do they seem to be willing, according to newspaper statements, to have scientific experimentation upon the dairy herd which were infected at the dairy show and have not been slaughtered. That the government should have its scientists experiment with this herd, and, if possible, discover the real virus and its habits, there can be no doubt. In all probability neither the slaughter nor quarantine method will be wholly successful until the nature and habits of the virus have been discovered and its manner in spreading contagion fought in a scientific way.

EFFICIENCY VS. ECONOMY.

Health is the greatest asset an individual, community or state can have. The prevention of disease, therefore, results in a great saving to the individual, community or state, and if the economic value of the Health Department could be figured in dollars and cents, the conclusion would readily be reached that no State Department ranks higher in importance than the Department of Health.

However, if newspaper reports are correct, the members of the Efficiency and Economy Committee, appointed by the last legislature, do not believe that the work of the State Board of Health is of sufficient importance, nor the services of the individual members valuable enough to justify the state paying the members either a per diem or a salary. It is not known that this Committee will advise the appointment of any other department whose members will serve without pay. It is quite certain that the members of this committee do not serve without pay and it is doubtful if their recommendations to the legislature will be of value if they recommend such economies as will prevent requisite efficiency.

Physicians serving in their professional capacity in hospitals, sanitaria, charitable institutions and state boards, without pay, have themselves to blame if the public should consider their services of no value. They further have themselves to blame for the reason it has been the custom for physicians to render their services free to hospitals and charitable institutions with the idea that the prestige, the clinical experience, the publicity and the honor amply paid them.

Until recently medicine had not been commercialized. The result is that the medical profession has been one of the poorest-paid professions, and the public has been accustomed to seek the co-operation of the physician wherever his services would be of benefit to mankind at large. Times have changed during the last decade. The medical profession is becoming well organized. It realizes the progress in medicine and surgery has been so great and rapid that it is necessary to employ teamwork to secure the best results. Therefore, we find that the bacteriologist, the chemist, the pathologist, the internist, the surgeon and the specialists are co-operating, and each expects compensation for his work. The same principle should apply to the work exacted by statute from the State Boards. "The laborer is worthy of his hire," and no state should expect efficiency in any board, if the members of that board receive only honor.

The organized medical profession of the State of Illinois should see to it that the statutes are not changed so as to emasculate the State Board of Health and place Illinois in the rear ranks of preventive medicine. Now is the time to protest against unwise legislation. If the present Medical Practice Act and the Public Health Acts are modified, it may open the flood-gates for a deluge of bills that will place the efficiency of the Health Department of the State of Illinois in jeopardy.

TUBERCULOSIS AND CANCER.

In this issue of the JOURNAL are found several articles upon the two most important diseases of mankind—cancer and tuberculosis. Medical science, progressing so brilliantly in most lines, has not evolved the solution in either of the two conditions. So far as producing a prophylactic or a cure for cancer, scientists have really accomplished little, and the outlook would be ill indeed were it not for the fact that these workers are learning many things about the nature and habits of carcinomata. In the face of all the work and investigation that has been done, it will hardly be disputed that cancer is increasing at an alarming rate.

With tuberculosis the outlook is brighter, and statistics show that this disease is being fought

with some success. The longevity of the tuberculous patient is increasing, and preventive measures are even more successfully employed.

No effort should be lost in fighting these diseases; no means should be left unemployed in the eradication of either of these maladies from civilization.

So far as cancer is concerned, the work at present is strictly the work of the scientist. The eradication of tuberculosis is now the work and duty of everyone—the medical man, the nurse, the welfare worker, the layman, the municipality. In Illinois, under the Glackin Law, the municipality can do very much indeed in maintaining institutions for the prevention and cure of this disease. Chicago has been the first city to take advantage of this law, and on another page will be found a condensed report, showing what has been done in the building of such an institution. While the publication of this report will be of more local interest to Chicago, it will also help other localities by showing how such institutions may be built and maintained under the present law.

ACTIONS FOR CIVIL MALPRACTICE.

ROBERT J. FOLONIE, L. L. B.,
CHICAGO.

Sixth Article.

It is the duty of a physician undertaking any operation on the human body to secure the consent of the adult patient, if practical, and if impractical because of unconsciousness, mental incapability or similar reasons, to secure the consent of members of the family. In the case of children the consent of a parent must be secured, preferably the father. It is not even sufficient to secure the consent of an elder sister or brother.

An exception to this rule exists in case of an emergency, where the patient is unable to give consent and there is no reasonable opportunity to communicate with the family.

The extent to which the law may go in such cases may be indicated by the unusual case of Drs. S. and B. Both were members of a hospital staff and the former was called to examine a patient brought hastily to the hospital in an ambulance, in an apparently unconscious condition. There was a history of attendance by another physician and an attempted delivery of the patient of a child. An examination disclosed a breach presentation and the uterus torn almost in two. Dr. B. was immediately called into consultation and excessive hemorrhage indicated that if the patient's life was to be saved, it could only be through an immediate hysterectomy, and minutes were precious. The patient was at once taken to the operating room—the operation successfully performed and the patient lived. Upon convalescence and further inquiry it was found that the patient was a deaf mute, that her husband who was present when the examination was made, was also a deaf mute, which had been discovered at the time through his inability to receive or make intelligible communications of any kind. It was subsequently discovered that neither husband or wife could read, write, or communicate with others, in any intelligible way.

Suit was brought against Drs. S. and B. for operating upon the patient without consent. Claim was made that the patient and her husband were of Jewish religion, that under their creed the barrenness of the wife was a ground of church divorce, that the husband was warranted under the beliefs of their church in deserting his wife and had done so, that by rendering her barren, the defendants had disgraced her in the eyes of her neighbors and friends.

It developed upon the trial that the mother of the patient was present in the ante-room when an attempt was made to communicate with the husband, that the fact of her presence had been incidentally mentioned to the physicians, but no attempt made to communicate with her or secure her consent.

The court instructed the jury that it was the duty of defendants to secure consent of the patient if practical and if impractical, to secure consent of a member of the family and failing so to do, would be liable in damages, no matter how skillful the operation.

Without discussing the mooted question, whether the mother was in law a member of the family, suffice it to say, that the instruction of the court correctly stated the general rule of the law. Instructions tendered for the physicians, that consent need not be secured in an emergency, were refused, on the theory that operation without consent in an emergency was only warranted when no person was present authorized to speak for the patient, and that such was not the case.

It may be greatly doubted whether the rules

of law as given in the case were in fact applicable; whether the case was not an exception to the otherwise proper rule, because of the unusual emergency requiring instant action if it was to be of value. Had the husband been present and been capable of expressing dissent and done so, the physicians would probably not have been warranted in interfering through the implied tender of the patient by bringing her to the hospital, even to save her life. In the absence of such dissent, it would seem unreasonable that the physician should take the burden of determining what ulterior motives may control those more remotely related and not integral part of the family.

The conceded fact in the case cited, that the patient would have died in a few minutes, but for the operation, out-weighed all other questions with the jury, who rendered a verdict in favor of the physicians, despite the court's instructions.

I am frequently asked whether it is advisable to secure written consents. This is largely a matter of judgment, but I am inclined to advise against securing them except where it is a rule of the hospital, and then to permit the hospital to follow its own rule in this respect. The physician in each case, however, should personally secure consent, which need not be done in any formal way and should be sufficiently comprehensive to permit the attendant to use his own judgment in the general field of the operation.

INTERPRETATION OF THE HARRISON ANTINARCOTIC BILL WHICH BECOMES EFFECTIVE AS A LAW MARCH 1, 1915.

The act which has special relation to the medical profession is Public Law 223 of the sixty-third Congress.

This act in its first section requires registration with the Collector of Internal Revenue, for the district in which he has his office by "every person who produces, imports, manufactures, compounds, deals in, dispenses, sells, distributes, or gives away opium, coca leaves or any compound, manufacture, salt, derivative or preparation thereof."

A tax of $1.00 per annum is payable at the time of registry and on or before the 1st day of July and annually thereafter. No employee of such registered person, acting within the scope of his employment is required to register. Officers securing such drugs for municipal hospitals or prisons are exempt from the terms of the act.

This act by its terms requires every physician to register, in default whereof, he will be subject to fine and imprisonment, if the drugs mentioned are at any time in his possession or under his control or prescribed by him.

By the second section of the act, it is provided that no person shall sell, accept or give away said drugs, except on a written order upon a form of blank for that purpose to be issued by the Commissioner of Internal Revenue and every person who gives such order shall make and keep a duplicate for two years, provided that the section shall not apply to the dispensing of the drugs to a patient by a physician registered under the act in the course of his professional practice only. Provided, however, that the physician shall keep a record of all such drugs dispensed or distributed, showing the amount, date and name and address of the patient, except such as may be dispensed or distributed to a patient upon whom the physician shall personally attend. This record is also required to be kept for two years.

The effect of section 2, with this limitation, must be considered in connection with section 8, which provides that it shall be unlawful for an unregistered person to have such drugs in his possession, with the exception that this shall not apply to an employee of a registered person or a nurse under the physician's supervision having such possession or control, by virtue of his employment or occupation and not on his own account,—and that the possession shall not be unlawful if the person has the drug which has been prescribed by a registered physician.

Further exception is made to section 2, that it is not unlawful to sell, dispense or distribute such drugs, by a dealer to a consumer on written prescription of a registered physician. Provided, however, that the prescription shall be dated as of the date on which signed and shall be signed by the physician who issued the same.

This section as a whole prohibits an unregistered physician from having the drugs in question in his possession, therefore, of course, prohibits him from using them or prescribing them.

A registered physician may have such drugs in his possession. If he personally gives them to a patient he need make no record of it. A registered physician directing the administration of such drugs by a nurse, unregistered interne, etc., should, to comply with this act, supply himself with appropriate blanks to put such directions in writing, providing such pad with a carbon sheet, so that a carbon copy of the directions may be torn out and delivered to the interne or nurse, the original being retained. If care is used to place the name of the patient and address of the patient, dates and amounts administered and kept for two years, it will doubtless serve the purpose of the law.

I do not find that the act expressly requires such record to be kept by the physician in his own handwriting. Arrangements can doubtless be made for the keeping of a separate morphine record in conjunction with a bedside record; care being used to see that this record comes into the possession of the physician in each case when the patient is discharged.

The physician should check each of these records while they are in the making, so that he may of his own knowledge thereafter know that they are correct.

The act in section 6 provides that provisions of the act shall not apply to any sale, dispensing or giving away or possession of preparations and remedies which do not contain more than two grains of opium or more than one-fourth of a grain of morphine or more than one-eighth of a grain of heroin or more than one grain of codein, or any salt or derivative of any of them in one fluid ounce, or if a solid or semi-solid preparation, in one avoirdupois ounce, or for liniments, etc., for external use only (except those which contain cocain or any of its salts, or alpha or beta eucaine or any of their salts or synthetic substitutes—provided such remedies are not sold or given away for the purpose of evading the intentions and provisions of the act.

The act authorizes the Collector of the District to demand of any registered person a correct statement verified by affidavit stating the quantity of said drugs received by him during three preceding months, the names of persons from whom purchased and the quantity in each instance received from each of said persons, and the dates.

I believe that it is of importance that the profession be informed of this act so that they may govern themselves accordingly, and any member of the profession desiring copies of the act can secure them through their Congressman by asking for a copy of "Opium and Narcotic Laws."

ROBERT J. FOLONIE.

CIVIL SERVICE EXAMINATION

The Cook County Civil Service Commission will hold the following examinations at 547 County Court House at the time and place indicated below. Applications must be made on blank forms, which will be sent on request, and filed with the Commission before noon of the day preceding the examination.

Resident Physician—Psychopathic Hospital (510)—Male and female—Class A, Rank 3, Grade 2—Pay: $75.00 month and maintenance. To be held 2 p. m., February 24, 1915.

The resident physician at the Detention Hospital is required to live at the institution, and is held responsible for the medical treatment of the inmates and the enforcement of the rules of the institution under the supervision of the county physician. He has full charge of the institution during the absence of the county physician.

The nature of the position makes academic and medical school education, service as an interne, experience in the treatment of nervous and mental diseases and hospital work valuable.

The scope of the examination will be: Special subject, weight 5; experience, weight 3; practical test, weight 2.

The new Psychopathic Hospital is entirely modern as to equipment, laboratories, etc., and an excellent opportunity is afforded resident physicians to get valuable experience in the treatment of nervous and mental diseases.

A. M. A. CONVENTION

Do not forget to make sufficient reservations to meet your requirements for the 1915 A. M. A. convention and exposition at San Francisco. Special train from Chicago superintended by the Gregory tour for physicians of Illinois, their families and friends.

Dr. R. R. Ferguson, Chairman,
Transportation Committe,
Chicago Medical Society,
Marshall Field Annex building, Chicago.

DEAR DOCTOR: Please reserve accommodations for ..... persons for the 1915 A. M. A. Convention and Exposition Tour.

I enclose herewith check for $....., being my first payment of ten dollars ($10.00) on each reser-

vation. Second payment of ten dollars ($10.00) will be due in thirty days.

Reservations may be transferred any time ten days prior to date of departure.

Yours very truly,

(Signed) .....

(City) .....

(Address) .....

ASSOCIATION OF THE MEDICAL RESERVE CORPS.

U. S. Army, New York State Division.
New York, January 7, 1915.

To the Editor:

The Gorgas medal to be given yearly in honor of Surgeon-General Gorgas has been established by the Medical Reserve Corps Association, New York State Division. This medal is open to competition to members of the Medical Corps of the United States Army, the Medical Reserve Corps of the United States Army, and to members of the Medical Corps of the organized militia. Officers may submit papers on any subject of a medico-military nature.

General Gorgas has appointed the following board of officers to act upon papers submitted: Colonel Charles Richard, Lieut. Col. Champe C. McCulloch, Jr., and Major Eugene R. Whitmore, Army Medical Corps. These officers are members of the faculty of the Army Medical School and will have sole authority to appoint the time that papers are to be submitted, and to pass upon the merits of the papers.

All inquiries should be addressed to one of these officers.

Very truly yours,

Lieut. Harold Hays, M. R. C., U. S. A.,
Secy. N. Y. State Division, M. R. C., U. S. A.

Other journals please copy.—J. P. M.

SHAKESPEARE REVISED.

—Courtesy of the Chicago Daily News.

Auto Sparks and Kicks

INTERLINERS IN NEW TIRES.

Extensive experience of actual users goes to show that interliners in any tire, new or old, are a positive advantage worth while. They render nail punctures fifty per cent less, decrease acute flexing of tire sidewalls, quite largely obviate "stone bruises," and give a better proportion between casing and inner tube than is offered by common sizes as now sold. As a result of a series of experiments I have found that an "oversize" casing with a good interliner well cemented in, will give over twice the service that the common pneumatic tire of intended size will offer in use on common roads.

EQUAL-SIZED TIRES ON FORD CARS.

Two Ford cars may be so changed that both can have three-and-one-half-inch tires all around without extra expense, except the excess of tire size. Remove the wheels without hubs from the front of one car and the rear of the other. Place thirty by three rims all around on one car, and thirty by three-and-one-half on the other. Put thirty-one by three-and-one-half tires on the car with the three-inch rims, and thirty by three-and-one-half tires on the other car. This gives equal-sized tires all around, and extra size.

CHANGING GEARS.

That clashing of gears that sounds so terrible may be avoided almost altogether if the change of gear is made with a sudden movement instead of slow pressure.

RAILWAY CROSSING.

Test observations have shown that only about four per cent of all automobiles crossing railway tracks use proper safeguards against accidents. The tendency of the car to slow up, the likelihood of the motor going dead, and lack of presence of mind, call for a very high degree of care. A driver who does not STOP—LOOK—and LISTEN before trying to cross a track should be fined for criminal carelessness.

It might also be well to call attention to the fact that when two persons are in the car and a track is crossed, as often happens, not at right angle but tangentially, the person not driving should look back on the track, while the driver scans the rails ahead.

KEEPING VARNISH BRIGHT.

The varnish on a new car, or a car newly painted, is liable to become speckled if it is rained on. The application of a mixture of equal parts of raw linseed oil and malt vinegar, if vigorously rubbed in, will render the marks less noticeable.—*Exchange.*

TO REMOVE GREASE FROM HANDS.

To those who object to the old method of thoroughly greasing their hands in order to make subsequent cleaning easy after an overhauling job it is recommended that a solution composed of four parts of alcohol, three parts of glycerin and three parts of water be used instead. This should be well rubbed in and the hands permitted to dry before work is commenced.—*Exchange.*

THE FORCE OF IMPACT.

When an automobile is running at the rate of fifty miles per hour a sudden stoppage is equivalent to the impact of a body that has fallen one hundred and twenty feet. When running at fifteen miles speed the impact is only equal to a fall of thirteen feet.

A TEST TO LOCATE TROUBLE.

When the motor starts hard, and you are uncertain whether the fault is with the ignition or the mixture, open the throttle wide and spin the engine with spark off, then turn on the spark and the engine should start, if the spark is correct, on the first half turn.

DO NOT PAY FOR A DOG.

When you run over a dog, and he is left so flat that you are almost tempted to go back and pump him up with your tire pump, don't do it. Do not even go back to pay for the damage. Chickens and dogs have no rights on the road.

OIL FOULED.

Spark plugs that are oil fouled may be cleaned easily by boiling them in washing soda solution.

This Page Reserved for Permanent State Meeting Announcements

The following schools of medicine will have Alumni Reunions, either at luncheon or dinner, at the next meeting of the Illinois State Medical Society, to be held at Springfield on May 18, 19, and 20, 1915:

(1) Barnes ..... St. Louis
(2) National ..... St. Louis
(3) Washington University ..... St. Louis
(4) Rush ..... Chicago
(5) Northwestern ..... Chicago
(6) P. and S. ..... Chicago
(7) Coll. M. & S. ..... Chicago
(8) Michigan ..... Ann Arbor
(9) Univ. Pennsylvania ..... Philadelphia
(10) General. . Alumni of all other schools not in the above list

Alumni of the above schools will receive shortly a letter of explanation from the Chairman of his Committee giving full details as to place and time. Suggestions for a speaker will be gratefully received.

Early reservations for rooms are requested, as it is possible the legislature will be in session. The Committee on Reservations will attend to your wants promptly.

All communications should be addressed to H. C. Blankmeyer, M. D., Chairman Committee on Arrangements, Springfield.

Society Proceedings

ADAMS COUNTY.

The first meeting of the new year, Jan. 16, 1915, was conspicuous for attendance, enthusiasm and scientific program.

At 9 o'clock the members gathered at Blessing Hospital, where a clinic was held by Dr. John L. Porter of Chicago, specialist in orthopedic surgery and an honorary member of the society. Thirty cases were examined at the hospital and consisted of Potts' disease, tubercular hip, torticollis, genu valgum and varum, plastic palsy, anterior poliomyelitis, etc. At 2 o'clock only about three-fourths of the patients had been seen, so the hospital kindly consented to provide the remainder with refreshments, and we adjourned to the Hotel Newcomb for dinner.

When the appetites were appeased the president called the meeting to order and in a few well chosen words introduced Dr. Porter to his friends and admirers. The doctor informed us what a pleasure it was to be with us again after an absence of three years and then presented a very practical and important paper on "Painful Affections of the Feet." He described various kinds of feet: (a) weak feet, (b) flat foot, (c) rigid foot, (d) gonorrheal, (e) metatarsalgia, and gave the treatment of each. A plaster of Paris model, one of the doctor's recent cases of flatfoot, was passed among those present, as well as various styles of steel foot plates, which the speaker stated were being used less and less each year.

Following the discussion of this excellent paper a short business session was held, during which a rising vote of thanks was extended to Dr. Porter and an invitation to visit the society again in the very near future.

After a number of private consultations the doctor returned to the hospital to finish the clinic.

At the conclusion of an extremely strenuous day Dr. Porter was escorted to the hotel, where a number of members were awaiting him, and all sat down to an elaborate five-course dinner.

Besides Dr. Porter the following were guests of the society on this occasion. Drs. Stremmel, Hermeteb and Hartman, Macomb; Dr. Dorsey, Jr., Keokuk, and the nurses of Blessing Hospital.

ELIZABETH B. BALL, M. D.,
Secretary.

COLES COUNTY.

The Coles County Medical Society met at the Charleston Hotel, Charleston, Jan. 5, 1915. The following officers were elected: President, Dr. J. G. Baker, Mattoon; vice-president, Dr. M. W. Bisson, Charleston; secretary-treasurer, Dr. Gertrude Transeau, Charleston; censor, Dr. J. T. Montgomery, Charleston; delegate to the state meeting, Dr. C. E. Morgan, Humboldt; alternate, Dr. T. O. Freeman, Mattoon.

A banquet followed the business meeting. After the banquet the president, Dr. G. B. Dudley, on behalf of the society, presented Dr. J. T. Montgomery with a written testimonial, signed by all the members, in recogniton of his services to the society, to the profession and to the community. The doctor was taken entirely by surprise. After a few minutes he recovered himself and responded with a fine speech of appreciation. Dr. T. O. Freeman and Dr. F. E. Bell then spoke of the doctor as a physician and man. Dr. Buchanan of Paris gave a humorous talk on Dr. Montgomery's fads. Dr. Allen of Arcola then spoke. Dr. Steven Young of Terre Haute, who was unable to be present, sent a letter of greeting. Dr. Wylie of Paxton, who had hoped to be present, sent a long letter full of reminiscence and admiration for the doctor. Drs. Epperson and Moody of Kansas were present. After the meeting an hour was spent in reminiscences.

We believe that the society is getting somewhere when all of its members can get together and honor a fellow member while he is living and an active competitor.

GERTRUDE TRANSEAU,
Secretary.

COOK COUNTY.

CHICAGO MEDICAL SOCIETY.

Regular Meeting, January 6, 1915.

1. "War from the Standpoint of the Military Surgeon," Col. Wm. Stephenson, M. C., United States Army, Chief Surgeon, Central Division.
2. "Smallpox and Vaccination," T. W. Raison, P. A., Surgeon United States Navy.
3. "The Medical Service in War with Special Reference to the United States Land Forces," Capt. G. M. Blech, M. C., I. N. G.

Joint Meeting Between the Chicago Medical and Chicago Urological Societies, January 13, 1915.

1. Fulguration Treatment of Bladder Tumors—Herman H. Kretschmer. Discussion—L. E. Schmidt.
2. Progress in Genito-Urinary Surgery—Gustav Kolisher.
3. What Surgery Offers in Kidney Lesions—Arthur Dean Bevan.

Regular Meeting, January 20, 1915.

1. Uterine Inertia and Its Management. Irving H. Eddy. Discussion—C. B. Reed, C. S. Bacon.
2. Resection of the Posterior Roots of the Spinal Cord for the Cure of Little's Disease.—M. E. Blahd, Cleveland, O. Discussion—Carl Beck.
3. Traumatic Hernia and Its Relation to the Workman's Compensation Act.—R. Robinson Duff. Discussion—R. W. Forrester, C. W. Hopkins.

Englewood Branch.

The January meeting of the Englewood Branch was held on Tuesday evening, Jan. 5, at the Englewood Hospital. President Dr. Joseph Sherlaw presided and the following program was presented:

PROGRAM.

1. Medical Treatment of Hyper Thyroidism.—F. S. Tufts.

2. Surgical Treatment of Hypo-Thyroidism.—John B. Haeberlin.

3. Treatment of Hypo-Thyroidism.—Harry G. Hardt.

The papers were very well written and the subject thoroughly covered.

The discussion was opened by Dr. Dean D. Lewis, who complimented the essayists on their thorough and painstaking work. He stated that as far as the treatment of hyper-thyroidism was concerned that we were not much further along than we were twenty years ago with the exception that the surgical treatment was more clearly defined. Surgical treatment for exophthalmic goitre he believed wrong, but that it was the best treatment we had and that the only thing to do is to operate. He believes that all cases showing tachycardia should be operated on and that we should not wait until the case becomes extreme. As to methods, he excludes Porter's operation. Polar ligation, he believes, has its place but that extirpation is the best. He called attention to the relation of the thymus gland in these cases, stating that most of the fatal cases, those dying on the table, showed, on post morten examination, an enlarged thymus.

Dr. Carl Langer stated that surgical treatment was the best thing we know now, but believed that something better would come. That surgical measures gave, at best, improvement in 80 per cent of the cases and failure in 20.

Others who entered the discussion were Drs. L. J. Osgood, E. B. Fowler, C. Hubart Lovewell, Julius H. Hess and J. J. Moorhead.

Dr. J. J. Moorhead showed an interesting case of hiccough in a woman 51 years old. It came one week after her last menstruation, which was in June, 1913. She was free while in bed but afflicted during entire day. The attendance was 94.

ARTHUR G. BOSLER,
Secretary.

COOK COUNTY

CHICAGO OPHTHALMOLOGICAL SOCIETY.

A regular meeting was held November 16, 1914, with the president, Dr. Wesley Hamilton Peck, in the chair.

THE INTRACAPSULAR CATARACT OPERATION.

Dr. William A. Fisher reported and exhibited ten cases on which he had performed this operation. At this time when the intracapsular operation was rapidly supplanting the old method in nearly all sections of India, it might be of interest to the profession to know exactly what could be expected from the operation. Most of the objections that had been made by the profession could be eliminated by proper attention to the Smith technic, would could be mastered by good operators before an intracapsular operation was attempted according to the method the speaker recommended to this society last March and published in *Ophthalmology*, April, 1914.

The ten patients with twelve operations he presented to the society were not selected cases, but ten consecutive operations and with them were two juveniles, operated upon May 16, 1914. All had been operated upon recently and none of them longer than three months ago except the double one. He presented the two juveniles on one patient operated on May 16 because it was unusual in America to operate on both eyes at the same time. Juvenile cataracts were not choice cases for the intracapsular operation and his needle was used more often in those cases than in senile cataracts. The younger the subject the more difficult it was to rupture the zonula, hence the frequent use of his needle in aiding the delivery of the lens. No loss of vitreous occurred in any of the cases when the needle was used. To present twelve operations, one-half of them being juvenile, seemed to him a severe test for the intracapsular operation. In one of the twelve operations, slight inflammation followed, probably caused by prolapse of the iris, but the patient was discharged with a vision of 20/30. This was the only case that had had any pain or received any after-treatment. Any operation that would remove the cataract and not be followed by inflammation would usually give good results and if the capsule was removed with the lens without loss of vitreous, postoperative inflammation would be rare. If an operator could successfully remove the lens in its capsule, the intracapsular operation would give the best average vision. Twelve operations, even though they be consecutive, were not numerous enough to form a definite conclusion, but it was a large number to get together at any given meeting in this city.

In all of these twelve cases the bandage was not removed from either eye until the ninth day, and slight inflammation followed only one, and that was the one with a prolapsed iris. He felt quite confident of a good result when he removed the lens in its capsule, because then he considered it useless or even meddlesome to remove the bandage from both eyes for nine days unless the patient complained. If the patient did not complain for nine days, one might assume all was well, and when the first dressing was removed, the only treatment necessary was dark glasses.

To do justice to Colonel Smith and his operation, he wanted to emphasize two of the so-called objections so often brought forward by good operators who had not adopted his method. First: the absence of drawn-up pupils, especially those that interfered with vision; second: the absence of astigmatism from the corneal section which had been made in all of those where only one out of the twelve had any astigmatism. He felt sure he never operated on twelve consecutive cases by the

old method without having some complications more serious than had occurred in these twelve, and he was sure he could never have obtained such good vision as had been obtained in this series by any other method than the intracapsular.

Before he reported the results of those twelve operations he wished to emphasize the importance of the Smith technic in any method of removing the lens. This could be mastered by good operators by adhering strictly to it in doing the old operation with the exception of cutting the capsule. If good operators would master the Smith technic in the old operation they would soon find themselves doing many intracapsular operations.

DISCUSSION.

Dr. Oliver C. Tydings had examined several of the cases exhibited by Dr. Fisher and could confirm what Dr. Fisher had said with reference to visual acuity. He did not think any member of the society, who had been doing cataract extraction for any length of time, had ever operated on so many consecutive cases with so little astigmatism as was shown in these cases. Absolute freedom from inflammatory conditions should commend this operation to the attention of the public. He believed sooner or later this operation would supersede all other operative efforts for the relief of cataract.

Dr. Charls H. Francis asked Dr. Fisher if in these cases he bandaged both eyes for nine days.

Dr. Harry S. Gradle said it was his good fortune to go over forty-five cases of Smith extraction with Professor Elschnig in the eye clinic at Prague and he compared these with three hundred cases of extraction within the capsule, and there was no greater astigmatism following the Smith operation than that following the capsulotomy method. Smith operated on both eyes at once.

Dr. Willis O. Nance asked Dr. Fisher if he considered it absolutely essential to the success of the operation to keep the eye bandaged for nine days. Personally, he felt such a procedure was not good surgery. In one case in which the bandage was left on for seven or eight days the cornea was found to be quite necrotic. Panophthalmitis had resulted and since that time, in every operative case, he had examined the eye at the end of the first forty-eight hours. There were three objections to the operation described. The first was the position of the corneal incision, it being much more in the cornea than the one employed when one expected to make a large conjunctival flap. Second, the possible loss of vitreous. Third, bandaging the eye for nine days without opening the bandage to see what condition the eye was in.

Dr. Fisher, in closing, said there was not one of the twelve patients exhibited who had experienced the slightest trouble on account of the bandage being left on for nine days, and the patients were here to speak for themselves. When the bandage was taken off there was no after treatment except in one which had a prolapsed iris.

(To be continued.)

EDGAR COUNTY.

The Edgar County Medical Society met in regular session in the lecture room of the Carnegie Library, Paris, Illinois, January 6, 1915. Members present: Drs. Clinton, Williams, E. O. Laughlin, Dugan, McCord, Shipman, Halloren, Hazen and Hunt. In the absence of the president, Dr. Bertha L. Clinton acted as president pro tem.

A resolution to amend the by-laws to change the date of the annual meeting of the society from the month of April to the month of January was introduced and passed its first reading.

The program committee was instructed to arrange for a public meeting for the purpose of a discussion of the subject of "Tuberculosis," the meeting to be held some time during the month of January, 1915.

Drs. Hazen, Laughlin and Williams were appointed a committee to investigate the amount of the annual dues necessary to conduct the society through 1916 and report upon the same at the next meeting of the society.

The regular program was next taken up and Dr. F. E. Shipman presented a very thoughtful paper upon the "Medical Treatment of Lobar Pneumonia." The essayist prefaced his treatment by a brief resume of the conditions to be met in the course of the disease, and said that while no routine treatment could meet all these conditions yet their severity and the ensuing results could be very much modified by the judicious adoption of certain recognized principles. The essayist called attention to the fact that in pneumonia it is not the pathology, but the morbid physiology which caused death. He sketched in detail the condition of the heart, blood vessels and nerves. The heart symptoms were the most important and the writer advocated the guarding and strengthening of this organ from the beginning; digitalis being his main reliance, and his object being to secure a strong digitalis heart when the danger period arrived. The drug of next positive value was camphor, in the form of 10 per cent. solution in oil, 5 c.c. administered hypodermically 3 to 5 times per day. The doctor spoke highly of this remedy and cited very convincing statistics regarding its beneficial effect. The combating of toxemia by activity of skin and kidneys was insisted upon and saline infusions recommended to attain this end. A review of the different drugs, inhalations and stimulants was then given. And the paper closed with the warning that procrastination has no part in the treatment of pneumonia as the patient in ten days was dead and buried or alive and well. The paper was very fully discussed and favorably received.

Dr. Wm. Halloren presented a paper on "Croup," in which he urged the danger of a mistake in diagnosing the membranous from the spasmodic variety. The membranous form was so rapid in development and so fatal in outcome that if it was suspected, large doses of antitoxin should at once be administered. And if the symptoms then progressed, intubation employed. The remedies and adjuvant treatment for the spasmodic variety were set forth, and the care of the patient during convalescence from the membranous form outlined. This paper was also fully discussed, and the value of intubation fully set forth by those who had employed it, the consensus of opinion being that its value was not properly recognized and that those who had been repeatedly disappointed in its results had employed it far too late. Employed at the proper time it was one of the most useful of surgical operations.

Society adjourned to meet January 27, 1915.

GEORGE H. HUNT,
Secretary.

EFFINGHAM COUNTY.

The annual meeting of the Effingham County Medical Society was held December 8, 1914. The following officers were elected: Dr. J. C. R. Wettstein, president; C. F. Cunningham, D. D. S., first vice-president; Dr. S. F. Henry, secretary.

The following papers were given which were all well discussed:

1. "Displacement of Uterus," Dr. Haumesser.
2. "Oral Sepsis as the Cause of Systemic Disorders," T. C. Cunningham, D. D. S.
3. "X-Ray as Aid in Gastro-Intestinal Diagnosis," W. E. Lawrence.
4. "Some Things to Do in a Confinement Case," S. F. Henry, M. D.

S. F. Henry,
Secretary.

HANCOCK COUNTY.

The regular quarterly meeting of the Hancock County Medical Society was held in the memorial room of the court house, Carthage, Illinois, January 4. Physicians in attendance were Drs. Holmes, Stremmel and Hartman, of McComb; Dr. Irwin, of Plymouth; Dr. Kelly, of Ferris; D. Bouseman, of Ft. Green; Drs. Edwards, Gaunt and Loomis, of Warsaw, and Drs. Jenkins, Frazier, Blender and Parr, of Carthage.

The first number on the program, a violin solo by Mrs. Percy Culkin, Miss Edith Lionberger accompanist, was much enjoyed. Two excellent papers were presented, one by Dr. Holmes, of Macomb, on "The Relation of the Surgeon to the General Practitioner." Another by Dr. Jenkins, of Carthage, on "Some Ailments of the Profession." Both papers brought out interesting discussions. A number of interesting cases were reported and discussed by those present.

S. M. Parr,
Secretary.

JACKSON COUNTY.

The December meeting of the Jackson County Medical Society was held in the Jackson Club Rooms, Murphysboro, Illinois, December 17, 1914. The following members were present: Drs. Carter, Daniel, Horstman, Roth, Molz, Hrabik, Sabine, Essick, Ormsby, Riseling and Wayman, of Murphysboro; Drs. Whitacre, Brandon, Lewis, Barrow, Mitchell and Thompson, of Carbondale; Dr. J. R. Tweedy, of Vergennes; Dr. W. W. House, of Oraville; Dr. John Bennett, of Ava. Visitor, Dr. A. C. Ragsdale, of Carbondale.

A motion by Dr. Molz, seconded by Dr. Sabine, that the dues be $3.00 for the ensuing year. Carried. A motion by Dr. Carter, seconded by Dr. Daniel, to change the meetings from monthly to quarterly. Carried.

As this was the last meeting of the year, the election of officers followed. Dr. O. W. Whitacre, of Carbondale, was elected president; Dr. H. M. Daniel, vice-president; Dr. L. R. Wayman, secretary-treasurer. Dr. J. R. Tweedy, of Vergennes, was elected member of the Board of Censors.

A paper was read by Dr. H. C. Mitchell on "Supra Pubic Prostatectomy." Discussion by Ormsby and Riseling, of Murphysboro. Another by W. A. Brandon, of Carbondale, on "Pneumonia." As this is a condition all are called upon to treat the discussion was general. So-So stories were presented by Dr. H. G. Horstman, of Murphysboro, and many of the physicians present told some of their amusing experiences in the sick room. Adjourned.

A banquet was held at the Logan House at 6:30, which was closed by talks from some of the members for the good of the society. The next meeting will be held in Murphysboro, March 18, 1915.

Louis R. Wayman,
Secretary-treasurer.

MADISON COUNTY.

The Madison County Medical Society held its regular monthly meeting on January 4, 1915, at the Commercial Club rooms in Edwardsville. It was a very interesting session.

Members present: Drs. Luster, Ferguson, Wedig, Scott (R. B.), Johnson, Kerchner, Schreifels, Scott (J. W.), Sutter, Smith (W. H. C.), Hamm, Barnsback, Wahl, Gillis, Wharff, Range, Robinson, Oliver, Hastings, Kiser, Hirsch, Burroughs, and E. W. Fiegenbaum. Visitors: Dr. J. A. Warner, of St. Louis, and Rev. Jas. R. Sager, pastor of the First Presbyterian church in Edwardsville.

Dr. E. C. Ferguson, of Edwardsville, presented notes and observations taken at the Harris clinic, conducted at the St. Francis Hospital in Litchfield, some time ago, when the nerve-blocking system was shown. Dr. Ferguson told of the five successful operations done there on that day and graphically described every detail of this method of local anesthesia. Everything was to the point and all details were made clear.

The second speaker of the day was Dr. J. A. Warner, of St. Louis, who had a paper on "Serum Therapy." He was assisted in the lecture by illustrations with fifty or more slides, showing the manufacture of the serum. The stereopticon was operated by Rev. Sager. Dr. Warner's talk was very instructive and was much enjoyed by his hearers. A vote of thanks was tendered to both of our speakers and also to Rev. Sager for his efficient assistance.

The application for membership of Dr. J. P. Hale, of Alton, was received and will be acted upon at the next regular meeting, to be held in Venice, on Friday, February 5.

Several good speakers have been secured for this meeting. Dr. H. Roberts, of Belleville, will talk on "Radium." Dr. George W. Cale, Jr., of St. Louis, chief surgeon for the Frisco lines, will speak on "Fractures."

E. W. Fiegenbaum,
Secretary.

PERRY COUNTY.

The following officers were elected by the Perry County Medical Society for 1915: Dr. A. W. Daggett, Belleville, president; Drs. M. Adles, Wolf, Templeton, Cleland and Kellar, vice-president; Dr. J. D. Byrne, secretary-treasurer; Dr. M. Adles, delegate to state convention; Dr. C. M. Brookings, alternate; Dr. R. D. Pope, as the society's representative to plan ways and means for a county hospital.

R. D. POPE.

ST. CLAIR COUNTY.

The annual meeting of the St. Clair County Medical Society took place on Thursday, January 7, 1915, at Belleville, Illinois, with President August Bechtold in the chair and the following members present: Drs. Bechtold, Hansing, Auten, R. L. Campbell, Lillie, Randleman, Raab, Duey, Dew, Trippel, Kunze, Bottom, Reuss, Roberts, Thompson, Hagarty, Wyatt, Renner, Miller, Otrich, Fulgham, Rayhill, Lane, Cleveland, Hilgard and Portuondo.

The treasurer's report showed a balance of $11.19, which the Board of Censors reported to be correct. The president made a verbal report of the progress of the society during the year.

The scientific program consisted of two very scholarly, able and interesting papers, one by Dr. E. P. Raab on "Pathology and Diagnosis of Mitral Lesions," and the other by Dr. C. W. Lillie on "General Treatment of Heart Lesions." Both papers were listened to with great interest by all members present and they covered the ground very thoroughly.

It was moved and seconded that a special meeting be held in East St. Louis during the month of February and that the president of the state society be invited to attend. Motion carried.

The following officers were elected by acclamation: R. L. Campbell, president; D. R. Duey, vice-president; A. Hansing, treasurer; B. H. Portuondo, secretary; E. P. Raab, T. Hagarty and W. E. Wyatt, board of censors; Dr. A. Bechtold, delegate, and C. P. Renner, alternate.

Dr. Campbell was escorted to the chair and in a few well-chosen words thanked the society for the honor conferred upon him. The application of Dr. Etherington was referred to the board of censors and they reported that they would prefer not to pass upon this application.

The society adjourned to meet again in February.

B. H. PORTUONDO,
Secretary.

STEPHENSON COUNTY.

The Stephenson County Medical Society held its annual meeting at the court house, Freeport, Jan. 22, 1915. The meeting was called to order by President Synder at 1:30 p. m. Dr. T. J. Holke read a paper on "Some Observations on the Vienna Clinics." It is the doctor's opinion that owing to the present war the clinic will be wholly disrupted and that it will take years to again get it running in the clock-like fashion that was obtained by the American Medical Association of Vienna.

The election of officers for the ensuing year resulted as follows: President, Dr. William L. Karcher; vice-president, Dr. W. B. Peck; treasurer, Dr. Nelson C. Phillips; secretary, Dr. J. Sheldon Clark; censor, Dr. W. T. Collins; delegates to the state meeting at Springfield, Dr. Cuthbert J. Leavy; alternate, Dr. James A. Poling.

Dr. Charles S. Bacon, professor of obstetrics of the College of Physicians and Surgeons of the University of Illinois, then read his paper on "Artificial Amnesia or Twilight Sleep in Labor."

Dr. Bacon said: The method has been tried in past years by various men with many failures. He said labor was markedly delayed and that some 28 to 40 per cent of the babies were deeply cyonosed when born. The doctor gave a detailed description of the drugs used and a minute description of the technic of employment. He described a standardized method now being worked out in Freiburg, Germany, and said this could not be but dangerous in many cases. He believed "dammerschlaf" unnecessary in a large majority of cases.

Dr. Bacon doubted somewhat the validity of many published reports from Germany. Warning was given never to attempt this treatment in the home, a well equipped hospital being the only place where it should be undertaken, no one should ever attempt this treatment without being fully acquainted with the drugs, the symptoms they produce and the dangers connected with them.

Dr. Bacon's address was well received and soundly cheered by the audience of some fifty physicians. A standing vote of thanks was voted and tendered Dr. Bacon by the Stephenson County Medical Society.

A contrary view of the subject was taken by Dr. N. R. Harlan, who quoted Dr. W. H. W. Knipe of New York in the December 5th issue of the *Medical Record:* "At Freiburg and elsewhere in Germany, by men who have been trained in Freiburg, there have been reported 8,000 cases of 'twilight sleep' with very excellent results, both for the mother and for the child; and it would seem that with similar technique and care, equally good results may be obtained in this country by those who follow the Gauss method." Eight thousand is a good many. Dr. Bacon says he himself has used the method in only two or three cases. Adolph Lobell reports 100 successful cases, A. J. Rongy 220 successful cases, Ratneff 200, while John A. Polak and W. H. W. Knipe have each had scores of cases, and report most excellent results. Permit me to read to you from page 887 of the December *American Journal of Obstetrics:* "These secondary effects of the drugs in no way hinder the progress of labor, nor do they put the life of the mother or the child in danger and to counter-balance them we save the patient the exhaustion incident to painful labor."

So there you are; Dr. Bacon tells us his idea is that the method is not good, yet these men just mentioned praise the method after they have observed its operation in thousands of cases; they tell what experience has taught them to be the truth.

In a dilemma like this, where one authority says one thing about a treatment and another says just the opposite there is one way to settle the matter yourself and that is to go where the treatment is administered and find out for yourself. This we did. We found neither mothers nor babies suffered any ill effects and that the mothers were delighted with it.

Ten years ago gas was discarded as unfit for surgical anesthesia. Today with perfected technique, gas can be used in any surgical operation. Yet this is the same gas used 10 years ago. "Twilight sleep" treatment was attempted years ago and failed but like gas, with new methods of administration, it is now a success.

Of course the treatment is dangerous in the hands of a physician not familiar with its application. The administration of any drug is dangerous in the hands of one ignorant of its proper use. But the giving of "twilight sleep" treatment by one skilled in the method is perfectly safe; the mothers are in no way injured, the babies are perfectly normal and not in the least harmed by it. Upwards of ten thousand happy, satisfied mothers today will bear out this statement and ten thousand healthy babies offer living testimony.

Dr. K. F. Snyder, outgoing president of the Stephenson County Medical Society, said his object in asking Dr. Bacon to come to Freeport to talk on the subject was to learn the truth from authority. He thought the authorities should decide the matter.

Dr. J. H. Stealy reported a case, a very nervous case, recently successfully delivered under twilight treatment at the Freeport General hospital, although her one previous labor had been to her a most disastrous and horror inspiring affair. Dr. Stealy said 30 grains of scopolamin had been administered to a dog without especially ill results and that the dose used in twilight method was only 1-150 to 1-400 of a grain.

Dr. J. S. Clark suggested the use of small doses of apomorphine to allay the nervousness.

Following the meeting the doctors gathered for dinner at the Angelos cafe and were served with an elaborate menu.

The following physicians were present at the meeting: Drs. A. E. Smith, D. G. Smith, Snyder, Karcher, Harlan, Stealy, Hewetson, Burns, Leavy, Peck, Phillips, E. H. Best, C. L. Best, Collins, Stober, B. Erp-Brockhausen, Hutchins, Linda K. Hutchins, M. L. Rosenstiel, Rideout, Arnold, Pettipiece, Diestlemeier, Stiver, Sikes, White, Poling, Holke, Mease, Clark, Downing of Warren, Kellar of Warren, Kreider of Lena, Lins of Durand, Johnson of Dakota, Walton of Rock Grove, May of Shannon, Miller of German Valley and Professor Bacon of Chicago.

A number of the nurses of the city were in attendance and also undergraduates from the Globe and Freeport General hospitals.—J. Sheldon Clark, secretary.

VERMILION COUNTY.

The Vermilion County Medical Society met in the City Council Chamber, Danville, January 11, 1915, with twenty-seven members present. Minutes of December 14 were read and approved. A lengthy discussion followed in regard to Dr. Mabel Blake-Phelps and other alleged illegal practitioners. Various means were discussed for getting these before the proper legal authorities. By motion, the secretary was instructed to correspond with the State Board of Health as to where we stand on such subjects and the proper mode of attack to rid the county of these pests. In the meantime it was suggested that each member be on the lookout for definite evidence against these practitioners.

The program of the evening consisted of papers on "Joint Fractures," by Drs. Hole and Steeley. Both papers were well written and a very lively and interesting discussion followed by Drs. Glidden, F. N. Cloyd, R. A. Cloyd, Dixon, Guy, Baumgart and Williams.

On motion the officers were empowered to expend money as they see fit for the entertainment of the society.

O. H. Crist,
Secretary.

WARREN COUNTY.

The regular meeting of the Warren County Medical Society was held at the Monmouth Commercial Club, on Friday, November 6, 1914. The meeting was called to order by the president, Dr. P. B. Conant, of Roseville. The minutes of the last meeting were read by the secretary, Dr. H. M. Camp, and the secretary's report was read, both of which were approved by the society. An extra meeting to be held each year, making them quarterly, instead of semi-annual, was voted, the extra meeting to come in June. Dr. Charles Patton Blair, of Monmouth, was unanimously elected to membership. Dr. Arthur K. Drake, of Monmouth, but formerly of Macomb, transferred his membership from the McDonough county society to Warren county.

The first speaker on the program was Dr. P. B. Conant, who talked on "Infantile Paralysis." The reason this subject was selected was the fact that Dr. Conant had had two cases appear at the same time, about twenty miles apart, and without any exposure to the disease. One of the case was a little school girl, who first noticed the paralysis while at school; the teacher had asked her a question, and noticing something wrong, went to her side, and found she was entirely unable to move her hand. She was sent home at once, and the doctor made the diagnosis soon after. In this case, there were apparently no prodromal symptoms; the child seeming to be in good health that morning when she left

home. The other case appeared at about the same time; showed similar manifestations, but no relation between the two cases could be determined. The essayist gave a brief history of this disease, bringing out the fact which is already well known, that the prodromal symptoms are practically always obscure, in the absence of an epidemic, and the paralytic manifestations have developed before the true nature of the disease is known. This paper was a very interesting one, and it was discussed freely by Drs. Luster, of Galesburg, Sherrick and Ebersole, of Monmouth, and McCutchan, of Alexis.

The next paper was read by Dr. Chauncey Sherrick, of Monmouth, on the subject, "The Relation of Trauma to Appendicitis." This subject of Dr. Sherrick's was a new phase of an old subject. It is frequently stated that the last word regarding appendicitis has not yet been said, and this fact was impressed upon those who heard this excellent paper. This paper also brought out another important point, that of searching persistently for the early and often forgotten facts in the history of a case, which in themselves may be sufficient to make a diagnosis. The paper was discussed by Drs. Franing, of Galesburg; Tombaugh, of Burlington; Mitchell, of Monmouth; McClanahan, of Kirkwood, and E. Wyllys Andrews, of Chicago.

After the discussion of Dr. Sherrick's paper was closed, the next speaker was introduced, Dr. E. Wyllys Andrews, of Chicago, who talked on "Accurate Adjustment of Wounded Edges and Surfaces by the Reunion of Divided Vessels." In his usual characteristic, deliberate manner, Dr. Andrews spoke of the process of wound healing and consequent scar formation. He gave his reasons why the scar following the same kind of operation is not always the same. Some are almost invisible while others are unsightly in appearance, even in clean cases. Dr. Andrews illustrated his talk with original drawings, showing his method of bringing the wound edges in apposition, and laid special emphasis on the necessity of bringing the ends of divided vessels as nearly together as possible, in order to give the greatest possible vascularity to the new tissue. This, in his opinion, was the key to successful scar formation. This paper was discussed by Drs. Sherrick and Mitchell, of Monmouth; Franing, Baird and Maley, of Galesburg, and Tombaugh, of Burlington, after which Dr. Andrews closed the discussion, and casually remarking that this was the first time he had talked on this subject, although he had been interested in it for some time, and had been working on the methods that he recommended.

The next talk was given by a former Monmouth man, Dr. John A. Robison, of Chicago, president of the Illinois State Board of Health. The subject was "The Relation between the State Board of Health and the Community." Dr. Robison illustrated the first part of his talk with stereopticon slides, showing the work done by the board in different parts of the state. He showed the various causes of infant mortality in the state and illustrated many of the points connected with the etiology of the conditions causing the death of so many infants. He showed that most of the infantile diseases are really preventable, and that the state board of health was at this time trying to minimize them as much as possible. Many health and recreation resorts were pictured, showing what has been done for the sick children who cannot get the care at home that is so essential for their welfare. After he had finished this part of his talk, he told of the work planned by the state board and its relation to the community at large, and asked for the hearty co-operation of every physician in the state. This fine talk was discussed by many physicians present, all of whom enjoyed the paper, and commended Dr. Robison and the present state board for the work they are doing and the things that they have planned for the future, which will undoubtedly do a great deal toward benefiting the health of the residents of Illinois. After this talk, the meeting was adjourned.

Those present at this meeting were: Drs. Ripley, Nash, Franing, Baird, Bohan, Hall, Wm. Maley, Geo. Maley, Johnson, Luster, Early, Corbin, Pollock, Bryant and McClanahan, of Galesburg; Chickering and McClanahan, of Kirkwood; Conant and Clarke, of Roseville; Crosier and McCutchan, of Alexis; Hainline and Crofton, of Seaton; Wright, of Aledo; Hiett and Jewell, of Little York; Marshall and Harter, of Stronghurst; McClanahan, of Viola; LeMaster, of Bushnell; Tombaugh, of Burlington, Ia.; McMillan, Linn, Blair, Unkrich, Graham, Sherrick, Mitchell, Camp, McCoy, Ebersole, Kampen, Burgess, Patton, Drake, Winters, of Monmouth; Zimmerman, of Cameron, and Foster, of Gerlaw. Also the following nurses: Miss Anna Johnson, Miss Herdman, Mrs. Pearce, Miss Patterson, Miss Burns, Miss Stocks, Miss Brooks, Miss Huey and Miss Elsie Johnson, all of Monmouth.

HAROLD M. CAMP,
Secretary.

WINNEBAGO COUNTY.

The Winnebago County Medical Society met in annual banquet at Nelson Hotel, Rockford, Illinois, January 4, 1915. Members present, 26; visitors, 1; Dr. E. E. Ochsner in the chair.

Following the banquet the minutes of the regular meeting held Dec. 8, 1914, and of special meeting held Dec. 24, 1914, were read and approved. Report of the secretary-treasurer was read and Drs. J. E. Allaben and O. Nordvall were appointed a committee of two to audit the treasurer's accounts for 1914. Dr. J. H. Maloney was voted in as a member of the society.

It was moved and seconded that instead of having the doctors' signatures appended to the revised fee bill, a statement be placed under same to the effect that it was passed by the Winnebago County Medical Society in meeting assembled Oct. 13, 1914. Motion carried. The secretary was instructed to write the

Rockford Hotel Co. a vote of thanks for all courtesies shown the society the past year.

Dr. Emil Windmueller, of Woodstock, Ill., councilor for first councilor district, was introduced to the society by the president. He explained that he came to this meeting to learn if a joint all-day meeting of Kane, McHenry, Boone, Stephenson and Winnebago counties could be held in Rockford about February 9, 1915, it being most centrally located. If so, he wished that a surgical and some other paper might be presented by certain members of this society. Dr. Windmueller stated that Dr. Albert L. Brittin, president of the Illinois State Medical Society, would be present to make an address and one speaker from each of the other county societies to be represented. It was decided by our society to have the joint meeting, and the newly elected president, vice-president and secretary were constituted a committee on arrangements for said meeting. It was unanimously decided that Dr. Allaben read a paper on some surgical topic and Dr. S. D. Wilgus another on some nervous disease.

The election of officers for 1915 resulted as follows: Dr. Horace M. Starkey, president; Dr. E. W. Goembel, vice-president; Dr. C. M. Ranseen, secretary-treasurer; Dr. D. B. Penniman, delegate; Dr. S. D. Wilgus, alternate; Dr. John Tuite, censor.

After the retiring officers had been given a vote of thanks for their services, the meeting adjourned.

DR. C. M. RANSEEN,
Secretary-treasurer.

Personals

Dr. W. H. Mercer has removed from Raymond to Decatur.

Dr. William G. Schmidt, Quincy, is reported to be critically ill.

Dr. J. J. Ellis has removed from Walpole, Ill., to W. Frankfort, Ill.

Dr. Cecil R. Driskell has removed from Farmersville to Raymond.

Dr. and Mrs. F. E. Tulley, of Granite City, are spending the winter in Los Angeles.

Dr. Harry O. Collins has been appointed a member of the staff of St. Mary's Hospital, Quincy.

Dr. Leo M. Czaja, Chicago, sailed from New York, January 13, for work with the Servian Red Cross.

Dr. Lemuel B. Short, health commissioner of East St. Louis, has also been appointed city physician.

The Illinois Society of St. Andrew, at its annual meeting January 8, reelected Dr. John A. McGill president.

Dr. Charles W. Miller, Peoria, was injured January 12, in a collision between his automobile and a street car.

Drs. Albert M. Earel and Robert S. McCaughney, Hoopeston, have been appointed local surgeons for the Chicago and Eastern Illinois Railroad.

Dr. Anna Dwyer has been appointed a member of the Chicago Morals Commission, of which Dr. George B. Young, health commissioner, is a member ex-officio.

Dr. Alden E. Smith, Freeport, has been elected president and Dr. Sara E. Hewetson, Freeport, secretary, of the Stephenson County Antituberculosis league.

News Notes

—At a meeting of the Medical Women's Club, January 13, Coroner Peter M. Hoffman of Cook County delivered an address on "Public Safety."

—A complete Roentgen-ray equipment has been secured at a cost of about $2,000, and will be installed in the new wing of St. Joseph's Hospital, Elgin.

—Thirty-five patients have been transferred from the Anna State Hospital to the new Alton State Hospital, and are quartered in a farm house which has been remodeled and fitted for that purpose.

—Dr. G. Frank Lydston, Chicago, charging misuse of his name in connection with a book, "Large Fees and How to Get Them," obtained an injunction from Judge Foell against the publisher, W. J. Jackman.

—At the twenty-third annual meeting of the Chicago Ophthalmological Society, held January 18, 1915, the following officers were elected to serve during the ensuing year: President, Dr. Richard J. Tivnen; vice-president, Dr. W. E. Gamble; secretary-treasurer, Dr. Paul Guilford; counselor, Dr. J. Sheldon Clark.

—At a meeting of the Board of Education, January 6, a committee was appointed, consisting of Drs. Peter C. Clemensen, O. F. Warning

and Stephen R. Pietrowicz, to cooperate with Daniel P. MacMillan, director of the Child Study and Educational Research Department, to assist that department in the scientific study of the defective child.

—At the annual meeting of the Association of Military Surgeons of the State of Illinois, held in Chicago. December 28, the following officers were elected: President, Lieut-Col. Jacob Frank, Chicago, surgeon-general of Illinois; vice-president, Captain Arthur F. Wilhelmy, Decatur, and secretary-treasurer, Brig. Gen. S. C. Stanton, Chicago (reelected).

—Eight full scholarships in Northwestern University Medical School have been established by Mr. James A. Patton, who gave a fund of $27,000 for this purpose. Two scholarships will be given to the two students in the college of liberal arts with the highest gradings each year till all eight are exhausted. The first two will be assigned in June, 1915.

—At the eleventh annual services of the Iroquois Memorial Association, held December 30, Health Commissioner George B. Young, Dr. Patrick Machler and Dr. Clara P. Seippel were the principal speakers. During the last year 17,437 emergency cases were cared for at the Iroquois Emergency Memorial Hospital, nearly 7,000 more than in the previous year.

—It is reported from Macomb that the physicians of that city have rented a portion of an office building and are attempting to work on a cooperation basis, the instruments of each to be of service to others. They will also place the knowledge of each at the disposal of others, and patients will enjoy the advice and consultation of all, at no additional expense.

—The Iowa and Illinois Central Medical Association met in Davenport, Iowa, Jan. 14, 1915, with the following program: "Dementia Praecox," W. A. Crooks, Rock Island; "Treatment of Diseases Through Nerve Reflexes," O. P. Sala, Davenport; "Significance of Visceral Pain," G. E. Decker, Davenport; "Pericolic Membranes," S. C. Plummer, Chicago.

—*The Madison County Doctor* for January prints an honor list of members with the number of meetings attended during the past year. The new president, Dr. Lay G. Burroughs, and the veteran secretary, Dr. E. W. Fiegenbaum, both score "100%"—as was to be expected. A fine portrait of Dr. Burroughs ornaments the publication and in a sketch of his life it is stated that he is the youngest man ever elected president of the society.

—On January 7, twenty-five members of the staff of the Illinois Charitable Eye and Ear Infirmary, Chicago, gave a farewell dinner to Charles T. Gerrard, superintendent of the institution for the last sixteen years. Dr. Norval H. Pierce presided as toastmaster, and a silver loving cup was presented to Mr. Gerrard by Alderman Dr. Willis O. Nance. Dr. James L. O'Connor has succeeded Mr. Gerrard as superintendent of the institution.

—Dr. Haim I. Davis reports that during 1914 2,807 patients were received at the hospital, of whom 1,677 were men and 1,130 women. The patients were distributed as follows: Chicago State Hospital, Dunning, 1,177; Elgin State Hospital, 397; Kankakee State Hospital, 516; Watertown State Hospital, 7; Peoria State Hospital, Bartonville, 29; Jacksonville State Hospital, 1; discharged cured, 633; transferred to County Hospital, 2; died, 36.

—The Society of American Bacteriologists held its annual meeting in Philadelphia at the Laboratory of Hygiene, University of Pennsylvania, December 29, 30 and 31, 1914. The following officers were elected: President, D. H. Bergey; vice-president, John Weinzirl; secretary-treasurer, A. Parker Hitchens; council, K. F. Kellerman, W. A. Stocking, Jr., R. E. Buchanan, H. J. Conn; delegate to A. A. A. S., M. J. Rosenau. The next regular meeting of the society will be held in Urbana, Illinois. The chairman of the local committee is Professor H. A. Harding. A special meeting of the society will be held in San Francisco during the summer.

—The Robert Koch Society for the Study of Tuberculosis has just been incorporated, with the following as its charter members: Theodore B. Sachs, M. D., Henry B. Favill, M. D., Frank Seward Johnson, M. D., Ethan A. Gray, M. D., John Ritter, M. D., O. W. McMichael, M. D., James A. Harvey, M. D.

The objects, as given in this charter, are as follows:

"The promotion of the study of the medical and laboratory aspects of tuberculosis, by bringing together those interested in the study, for discussion; by the formation of special libraries relating to the

subject; by special research work and by such other means as may be found to be desirable; also for the dissemination of information upon the subject among the medical profession."

This society has held fourteen meetings since February 11, 1913.

—We have received from Dr. King of Atlanta, Ga., a beautiful announcement of the opening of the King Sanitarium, which has just been built and equipped in the most modern manner. Dr. King is an honorary member of the Chicago Medical Society and has been one of the most energetic and industrious helpers the past three years in bringing about successful meetings of alienists and neurologists of the United States, held under the auspices of the Chicago Medical Society. We bespeak for Dr. King a most successful undertaking and hope that the physicians of Chicago and Illinois will be as good in giving Dr. King their support as Dr. King has been in giving his valuable aid to Chicago and Illinois.

—President Reinberg of the Board of County Commissioners of Cook County has nominated the following staff of consulting physicians and the nominations have been approved by the county board: Drs. Arthur D. Bevan, Frank Billings, Charles P. Caldwell, James A. Clark, Alfred C. Cotton, Arthur R. Edwards, William A. Evans, Edward A. Fischkin, Burton Haseltine, James B. Herrick, Albrecht Heym, Anton A. H. Holmboe, Charles E. Kahlke, Jacob S. Kauffman, Blue Island, Franklin H. Martin, Mary G. McEwen, John B. Murphy, Albert J. Ochsner, John R. Pennington, Stephen R. Pietrowicz, William E. Quine, John A. Robison, Otto L. Schmidt, Daniel A. K. Steele, Daniel P. Teter, Camillo Volini, Charles J. Whalen and George B. Young.

Marriages

ARTHUR COLUMBIA PEARMAN, M. D., to Miss Katherine Keeler, both of Rockford, Ill., December 12.

Deaths

FRANK A. BARBER, M. D. Bennett Medical College, Chicago, 1878; died at his home in Chicago, December 27, aged 60.

A. E. VAN DEVENTER, M. D. Northwestern University Medical School, Chicago, 1863; died at his home in Oswego, Ill., about December 22.

THOMAS SMITH MIDDLETON, M. D. Medico-Chirurgical College of Philadelphia, 1897; of Chicago; died in New Hope, Pa., December 26, aged 46.

SHERWOOD E. SEELEY (license, Illinois, years of practice, 1877), for half a century a resident of Fulton, Ill.; died at his home, December 18, aged 82.

EDWARD P. WARD, M. D. Berkshire Medical College, Pittsfield, Mass., 1845; a practitioner of Chicago for many years; died in a sanatorium in Kenosha, Wis., December 18, aged 91.

FRANKLIN A. CLEMENT, M. D. Washington University, St. Louis, 1873; for thirty-five years local surgeon for the Burlington System at Greenfield, Ill., and twice mayor of the city; died at his home December 25, aged 64.

CALAWAY GARNER REAGIN, M. D. Miami Medical College, Cincinnati, 1877; a Confederate veteran; for many years a practitioner of Duquoin, Ill., and once president of the Perry County Medical Society; died at his home in Fort Meade, Fla., December 31, from pneumonia, aged 79.

MORLEY DA COSTA BATES, M. D. Rush Medical College, 1891; a Fellow of the American Medical Association; instructor in medicine in his Alma Mater; a member of the staff and treasurer of Grace Hospital, Chicago, and physician to the Metropolitan West Side Elevated Railway Company; died in the Presbyterian Hospital, Chicago, December 24, from cerebral hemorrhage, aged 42.

JAMES DELAFORET WHITLEY, M. D. Rush Medical College, 1874; a member of the Illinois State Medical Society and a Fellow of the Royal Microscopical Society of London; a veteran of the Civil War, in which he served in the Hospital Corps; local surgeon of the Chicago and Alton Railroad; medical health officer of Petersburg, Ill., for sixteen years; died at his home in that city, December 13, aged 70.

Obituary

THADDEUS O. BANNISTER, M. D.

Thaddeus O. Bannister, M. D., New York University, Medical College, 1856; formerly a member of Livingston County Medical Society; one of the oldest practitioners in Illinois; died at his home in Odell, Jan. 18, 1915, aged 81 years.

He began the practice of medicine in Waterloo, N. Y., Jan. 7, 1857, he was united in marriage to Hannah E. Pound of Marengo, and he is survived by Mrs. Bannister and three sons, George Steele, of Chicago, Harry J., of Esbon, Kansas, and Thaddeus O., of Minneapolis. After his marriage he removed to Phelps, N. Y., where he practiced his profession until the Civil war. He was then engaged by the federal government as contract surgeon for duty at Fairfax Hospital, Virginia, and later at Armory Square and Campbell Hospitals, Washington, D. C., where he served till the close of the war. In 1865 he removed to Odell, where he resided continuously. For about thirty years he served actively on the school board and most of that time he was president of the board. His strong, sterling character and wise administration were potent factors in placing our school system on a par with those in the larger cities throughout the state. When he began to feel the infirmities of age and desired to be relieved from further duties on the school board he was urged almost unanimously to continue in service, and when he still refused the entire community expressed regret at losing his valued services. When the village was incorporated in 1872, he was one of the moving figures in perfecting the organization and was elected as a trustee on the first board. From that time on he served on the village board at various times for about fifteen years, either in the capacity of president of the village or as a member of the board of trustees. He was of a progressive spirit and believed in improvements of a permanent character and was instrumental in securing the present water system now owned by the village. In the early days the doctor, in the practice of his profession, was often called to make trips twenty-five miles into the country, when the condition of the prairie roads meant the absence of a day and a night from home. Many times when the highways were impassable for horses he walked five miles and more into the country to perform service to his fellow men. Such was his devotion to duty.

Dr. Bannister was one of the type of country practitioner immortalized by Ian Maclaren, a lovable man, the trusted guide and councilor for three generations of his clients. Always an ethical man, his contempt for all quacks and "pathies" taxed his vocabulary. Always charitable, he held the quack worse than the infidel.

MEDICAL SCHOOL INSPECTION.

There are 330 public schools in Chicago with an attendance of approximately 330,000, and 250 parochial schools with an attendance of approximately 150,000.

Health officers from the Department of Health made visits according to the tabulation of their daily reports as shown below, since the reorganization in March.

Month	Visits to Public Schools	Visits to Parochial Schools
March	6,975	2,758
April	5,301	1,860
May	5,651	2,185
June	6,373	1,815
Four months' total	24,300	8,618

It will be seen from the above figures that while the parochial schools handle a little less than one-half as many children as the public schools, only about one-third as many visits are made to them as to the public schools. In other words the children in the parochial schools are receiving very much less in due proportion of the benefit derived from the expenditures of the city for the preservation of the health of the school children. As this money is the product of taxation which is shared by all, the children in the parochial schools are, of course, entitled to a full proportionate share of the expenditure and the department would be very glad to provide the benefit of the medical and nursing service to all such schools.

It is well understood that the best time to conserve health is in childhood. For this reason it is urged upon those who have not as yet permitted school inspection, that they give the department their cooperation now, at the beginning of a new school year.

A vacation that does not recreate is not much of a vacation.

—Bulletin Chicago Department of Health.

Do not begrudge your boy a ball game on the vacant lot after school hours. The strenuous exercise he will get in the open air after his day in the classroom will do him good. In other words, do all you can to encourage the out-door habit.

NEW AND NONOFFICIAL REMEDIES.

During December the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion with New and Nonofficial Remedies:

Merck & Co.: Arbutin, Merck; Benzene, Merck H. P., crystallizable; Digitoxin, Merck; Silver Citrate; Silver Lactate.

E. R. Squibb & Sons: Pyocyaneus Vaccine; boxes or 2 ampules containing respectively 100 and 500 million killed bacilli.

Pasteur Antirabic Vaccine: The virus is prepared according to the method of the Hygienic Laboratory, Washington, D. C. A dose is sent by mail each day. Twenty-one to twenty-five doses constitute a treatment. Laboratory of W. T. McDougall, Kansas City, Kansas.

Solution Pituitary Extract. A solution of a purified extract of the posterior lobe of the pituitary gland of the ox. Is is assayed so that 1 c.c. represents 0.2 Gm. fresh gland. It is used by hypodermic or intramuscular injection mainly to stimulate the uterus contraction in labor. It is supplied in the form of ampules containing 1 c.c. Solution Pituitary Extract. The H. K. Mulford Co., Philadelphia, Pa. (*Jour. A. M. A.*, Dec. 5, 1914, p. 2043.)

Radium Bromide: The market supply is a mixture of radium bromide and barium bromide and is sold on the basis of its radium content. It is sold for use in applicators, inhalatoriums and injection solutions, Radium bromide is marketed as:

Radium Bromide, Radium Company of America. All deliveries are made subject to the test of the U. S. Bureau of Standards or any reputable expert designated by the purchaser. The Radium Company of America, Sellersville, Pa.

Radium Bromide, Standard Chemical Co. Sold by the Radium Chemical Co., Pittsburgh, Pa. (*Jour. A. M. A.*, Dec. 26, 1914, p. 2289.)

Radium Carbonate: The market supply is usually a mixture of radium carbonate and barium carbonate and is sold on the basis of its radium content. It is sold for use in applicators. Radium carbonate is marked as:

Radium Carbonate, Standard Chemical Co. Sold by the Radium Chemical Co., Pittsburgh, Pa. (*Jour. A. M. A.*, Dec. 26, 1914, p. 2289.)

Radium Chloride, Radium Co. of America: This form of radium chloride has been accepted for inclusion with New and Nonofficial Remedies. Radium Co. of America, Sellersville, Pa.

Radium Sulphate, Radium Co. of America: This form of radium sulphate has been accepted for inclusion with New and Nonofficial Remedies. Radium Co. of America, Sellersville, Pa. (*Jour. A. M. A.*, Dec. 26, 1914, p. 2290.)

Cupric Applicators (Copper Sulphate 20-25 per cent.): Wooden sticks 6½ inches long tipped with a mixture of copper sulphate, alum and potassium nitrate, containing 20 to 25 per cent. copper sulphate. Antiseptic Supply Co., New York. (*Jour. A. M. A.*, Dec. 26, 1914, p. 2290.)

Book Notices

THE CLINICS OF JOHN B. MURPHY, M. D., at Mercy Hospital, Chicago, December, 1914. Published bimonthly by W. B. Saunders Company, Philadelphia and London.

This volume of Murphy's Clinics concludes Volume III, and is of equal interest as the preceding numbers. He gives the usual space to clinical diagnosis and discusses the following cases:

Appendicitis in pregnancy.

Auto-sensitized autogenous vaccines.

Impacted fracture of external tuberosity of tibia.

Sarcoma of the right tibia.

Exostosis of interarticular surface of upper end left tibia.

Multiple metastatic arthritides.

Cartilaginous exostosis of left humerus.

Bilateral tuberculosis epididymitis.

Gummatous tumor of the testicle.

Perforating duodenal ulcer fixed to the anterior abdominal wall.

Retroperitoneal sarcoma of the upper abdomen.

FEVER, ITS THERMOTAXIS AND METABOLISM, by Isaac Ott, A. M., M. D., Professor of Physiology Medico-Chirurgical College, Philadelphia, member of American Physiological Society, ex-president of American Neurological Association, consulting neurologist Norristown Asylum, member of Deutsche Medicinischen Gesellschaft of New York, member of Verainigung Alter Deutschen Studenten in Amerika, American Society for Pharmacology and Experimental Therapeutics, Society for Experimental Biology and Medicine, member of the American Association for the Advancement of Science, corresponding member of Atlantia Academy of Medicine, member of Philadelphia Medical Club and Chemists' Club of New York, etc. Paul B. Hoeber, 67-69 E. 59th street, New York. 1914.

This little volume comprises three lectures of the Medico-Chirurgical College. It goes rather deeply into the subject of fever, and is of special interest to the physiologist.

ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE OF THE UNITED STATES FOR THE FISCAL YEAR 1914. Washington Government Printing Office. 1914.

FORTY-SIXTH ANNUAL REPORT OF THE SECRETARY OF STATE ON THE REGISTRATION OF BIRTHS AND DEATHS, MARRIAGES AND DIVORCES IN MICHIGAN FOR THE YEAR 1912. Frederick C. Martindale, Secretary of State.